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## International Bureaucracy

AN incident occurred during the past week, the full import of which most Americans have failed to appreciate. N. C. Havenga, the Minister of Finance of South Africa, announced the sale of 100,000 ounces of 22 carat gold at \$41 an ounce. The Union of South Africa last year produced 11.6 million fine ounces of gold, accounting for 55 pct of the world's total production outside of Russia. Gold mining is a major industry. Its output and the price received have a vital bearing on the country's prosperity and balance of payments.

To the ordinary layman it might seem that the disposition of this gold was a matter that fell entirely within the sovereign concern of the South African commonwealth. He will therefore be surprised to learn that Mr. Havenga was taken to task for this deal, that his motives were questioned and the accuracy of his statements challenged. Furthermore, this reproof came not from opposition parties within the commonwealth, but from the World Fund, one of the great international bureaucracies which the United States has helped to spawn since the end of the war.

What reason for this brazen impudence? The Fund is one of the twin offspring of the Bretton Woods Conference authorized by Congress and implemented with \$2750 million of American money. It was conceived by a combination of British Socialists and American New Dealers as a super national device for insuring managed currencies in all the member nations. Its authors believed that gold was an anachronism, a "barbaric relic." As an instrument for guiding modern monetary systems it compared with a blacksmith's forge for turning out steel rails. Modern money must respond only to the wisdom and incorruptibility of enlightened planners.

With an eye to ancient prejudice, which could not yet be defied with safety, gold was given a position of apparent importance as a monetary backstop. Thus the boys who could not clear the cobwebs out of their mental gears fast enough could be persuaded that gold was still the basic regulator of currencies.

As a part of this scheme, it was agreed that gold must never be permitted to trade in a free market. Whenever it moved at home into the arts and industry, or internationally to shift balances, it must always move at \$35 an ounce. Thus, no matter what happens internally to the member countries in the way of budgetary malpractice, trade distortion or currency abuse, all money will retain the same status in the foreign exchange marts as prevailed on July 1, 1944, at the very peak of a world war.

In other words, we have in the Fund an instrument for worldwide price fixing. It is an attempt on the part of a securely entrenched international bureaucracy, with salaries freed from the national taxation which all other mortals must pay, to control the monetary policies of 46 member nations. Last year France kicked over the traces, created a free gold market and for its defiance has been denied the facilities of the Fund. The Union of South Africa, by selling gold above the mandatory \$35 level set by the monetary commissars in Washington, may be inviting a similar reprimand. We hope that Mr. Havenga will stick by his guns.

Joseph Staggs Lawrence

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► Electrogalvanizing bath life has been substantially lengthened at one plant by the use of an addition agent which permits the bath to be maintained at a pH of 5.8 rather than about 4. The addition material also adds to throwing power and imparts improved secondary qualities to the coating.

► A gun which does not recoil when fired has been demonstrated by the Swedish Bofors armament works. Its calibre was not disclosed. Part of the explosive charge is directed backwards cancelling the recoil.

► A new 1200-ton hydraulic press for making plastic washing machine agitators is being installed in a Chicago plant. The press is novel in that it employs a single platen and is top operated rather than using multiple platen with the pressure exerted from the bottom.

► Fast electroplating through the use of alkanesulfonic acid baths appears likely soon. The first attempts in this direction a couple years ago proved impractical, but research since then has removed many of the bugs. The anion is stable to hydrolysis and processes for Cu, Ni, Fe, Pb, Sn, Cd, Zn and Ag seem feasible. Copper deposition is getting the most attention at the moment with baths having been successfully operated at current densities as high as 1500 amps per sq ft.

► This week conversion steel deals are on their last legs—except those which are covered by irrevocable contracts. Some ingot buyers have a lot of stock on hand or under contract which may bring much lower prices than a few months ago. Some in conversion deals are aghast at the size of inventories on hand.

► Italy, long an importer of fuel, may be on the verge of an enormous oil strike. The Po Valley has a geological structure similar to the Persian Gulf, being actually an extension of the Gulf and perhaps equally rich.

► During the past year many shallow drillings have been made between Milan and Venice, and have struck gas in great quantity, which is being piped to industrial plants in that area—thus eliminating their need for coal imports. American and foreign countries are poised to enter the area to deep drill for oil as soon as the Italian state alters its antiquated laws to assure sufficient scope and continuity of operation.

► As production for production's sake ceases to be industry's prime objective and cost reduction becomes more vital, tooling experts feel there will be a major swing from carbide cutting tools and a revival of high speed cutting tools. War Production demands largely obliterated consideration of optimum costs of machining, but now economic conditions are forcing closer cost analysis and control, which bids well for high speed steel cutting tools.

► Deposition of aluminum on previously copper-plated steel parts has been accomplished by one manufacturer—but the process is not adaptable to commercial use. A fused salt bath of AlBr<sub>3</sub> and AlCl<sub>3</sub>, kept under pressure and at 200°F, was used.

► Major producers are not considering carbon steel price cuts now. They won't do so until they know more about labor costs and business prospects. When they do start to shade prices the first cuts will be made either by selling strip on the sheet extra card, or by actually reducing or dropping some extras.

► A tinplate works is under construction at Godivai near Oporto, Portugal. Machinery and black plates will be delivered by France.

► Next month the former Hermann Goering works, Salzgitter, will begin operation of 2 out of 3 blast furnaces they have been allowed to retain. The works will produce from local ores, with output destined for Rhur steel production.

► Tool and die plants in the Detroit area have been feeling more than a slight setback in business. It is estimated by one of the leading companies that the competition for the little work coming through has brought bids down to just about 50 pct over the direct cost of labor.

► Companies disposing of scrap require a complex setup to realize top returns—but it can pay handsome dividends. One company saw its revenue from scrap sold jump from \$1100 to \$3300 per month simply by checking its marketing system. The program involved segregation into 21 grades rather than 12, but was well worth the effort.

► Placing of "phantom orders" under the industrial mobilization planning program will shortly be expanded. Soon to receive dry run orders will be factories producing critical components and parts, such as fractional hp motors and ball bearings, which proved to be bottlenecks to overall production in the recent war.



# Practical Applications of

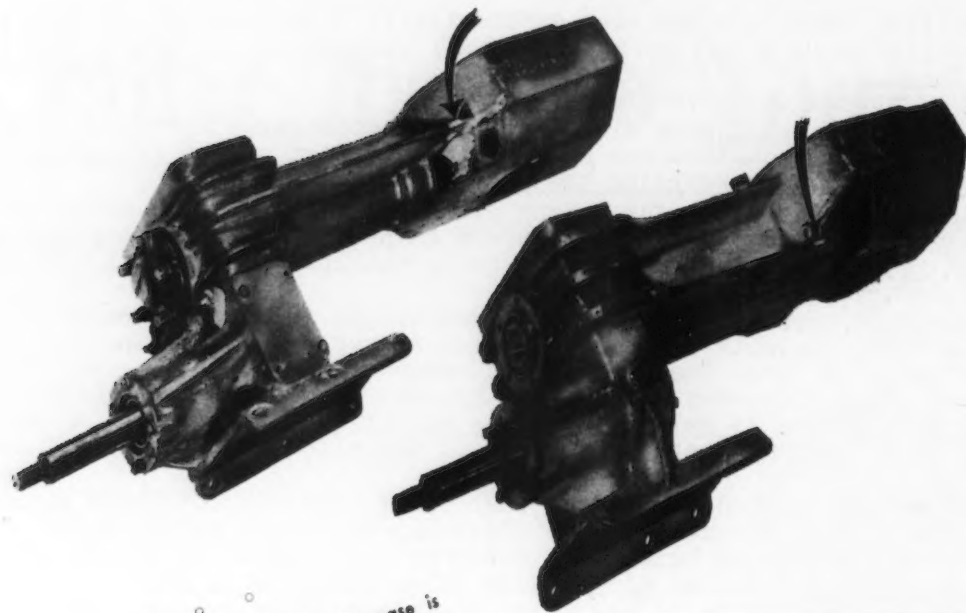


FIG. 1—Original design of transmission case is shown at the top left. Arrow points to strain gage near the junction of the rib and gear housing where stress was highest. Modified design is shown at the lower right. Corresponding gage, indicated by arrow, revealed strains only one-third as large as in the original design.

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FIG. 2—Test setup to simulate torque input from tractor. The load is applied by a jack, not shown, is the chamber behind the plunger.

# Stress Analysis at 1-H . . .

**M**ANY problems of stress and strain in designing and manufacturing mechanical equipment are not amenable to mathematical analysis. However, a quick and practical solution of these problems can often be reached by direct measurements using strain-sensitive lacquers and strain gages.

A number of applications of experimental stress analysis have been made at International Harvester Co.'s manufacturing research department. The method of attack on some of these is described in this article.

Farm equipment design often requires that certain parts be made strong enough to overcome overloads far in excess of normal requirements. Minimum weight per unit of power may often be unimportant except for economy considerations. In fact, weight eliminated from more expensive machined parts can sometimes be replaced elsewhere with comparatively inexpensive materials.

Fig. 1 illustrates a cast iron transmission case from a power takeoff hay baler which yielded premature failures in preproduction pilot models on heavy field service tests. A similar case, but reinforced, is also shown in fig. 1. The single bracing rib in the original design was considered to provide insufficient flexural rigidity against bending in a plane perpendicular to it, caused by reactions of the gears in the housing. The double ribbing of the new case was intended to correct this.

This modification was compared with the first case by stress measurement with the baler statically loaded through the power takeoff shaft, as shown in fig. 2. First, a qualitative survey of the entire surface was made with Stresscoat to locate the regions of greatest apparent strain. These strains were then measured with strain gages. On the first case the junction of the longitudinal rib with the large housing was found to be the most critical point. This was consistent with actual failures and strains high enough to be serious were indicated. In the new case these strains were shown to be reduced to a third of the original value.

The small size of strain gages has permitted a study of the stress variations of parts as small and compact as connecting rod bolts in location. Bolt failures can develop from a number of causes: (1) Improper tightening torque

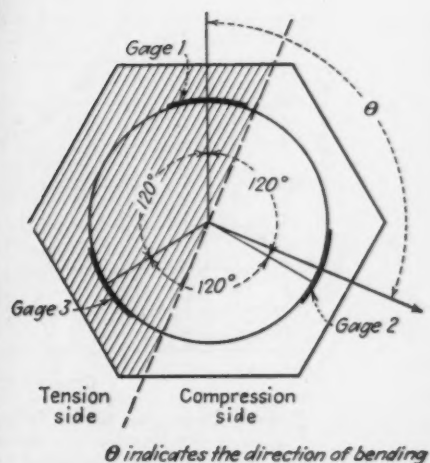
*Stress analysis studies of mechanical parts, where the original or proposed design was inadequate for the service intended, are described by the authors. By using brittle lacquers to establish areas of maximum stress and then applying SR-4 strain gages for measurement of the strain, quick and practical solutions to a variety of problems have been obtained. Residual stress measurement techniques, methods for material analysis and other work are also described.*

and lubrication; (2) inadequacy of the bolt material or dimensions for supporting the tightening torque; (3) connecting rod design which permits excessive variations in bending and tensile stresses; (4) excessive wear of the journal and bearings; and (5) machining errors in either the rod or bolt.

Various opinions exist as to the influence of each of the factors. However, strain gage



**FIG. 3**—Location of strain gages on the shank of a  $\frac{3}{8}$ -in. diam connecting rod cap screw. Diagram illustrates the effect of bending on the gage readings. Large arrow  $\theta$  is the direction toward which the bolt bends.



measurements of the bolt itself facilitate a specific test of relative significance.

Fig. 3 shows a common type of connecting rod bolt with strain gages applied at several positions on the bolt shank. These gages enable separate determinations of tension, of direction and magnitude of bending, and of torsion. The first three quantities can be found with a simple pattern of three axially-aligned strain gages at 120° separations, as shown in the diagram. Tests have shown that the variation of stress due to bending can be much larger than the change in tension in the bolt when external loads are applied to rods. The bending stress is due to elongation of the bore which tends to bend the bolt outward.

Because of the high fastening stress in connecting rod bolts—in some cases around 100,-

000 psi-stress variations must be kept very small to prevent failure by fatigue. Possible mismating, due to burrs or other irregularities, of the undersurface of the bolt head with that being held may result in considerable bending stress from the fastening alone.

Both the direction and magnitude of the

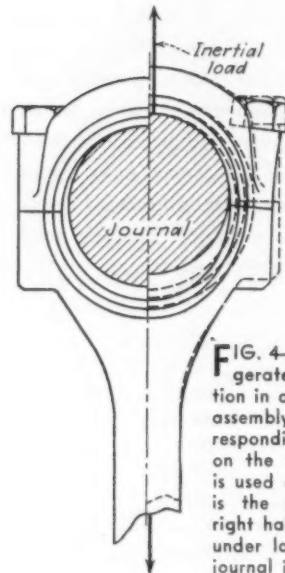


FIG. 4—Schematic and exaggerated diagram of deflection in a connecting rod crank assembly under tension corresponding to the inertial load on the cap when the engine is used as a brake. Left half is the undeflected rod and right half is the rod deformed under load. Good fit of the journal is important in inhibiting bending.



FIG. 5—Arrows indicate starting points of fatigue-failure fractures on these rods tested in torsion. Weak points were located with Stresscoat and were checked, stress v. applied load, with strain gages.

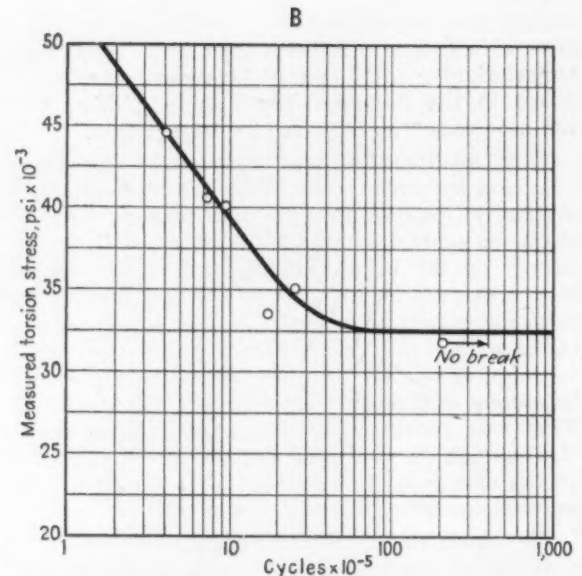
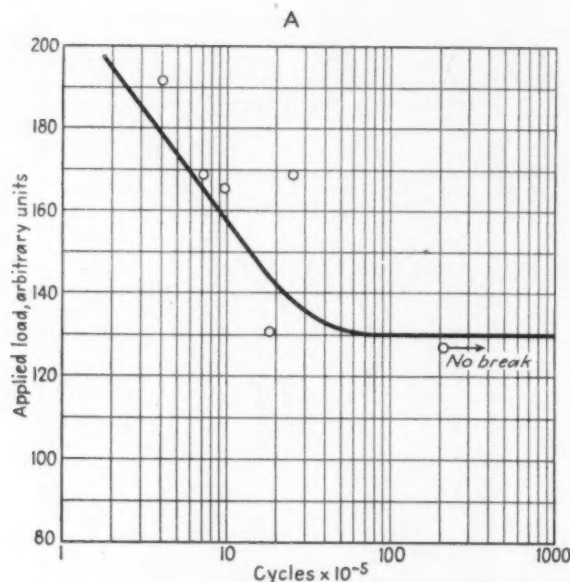


FIG. 6—Data from torsion fatigue test on connecting rods of 8640-H steel. Measured local stresses, plotted in graph B, show considerably less scatter than the data from externally applied loads, plotted in graph A. Score in graph A is adjusted to coincide with graph B if stress concentration factor is constant.



bending may change on loading in service, the direction of such a change being outward as shown in fig. 4. It is necessary to find the point on the bolt circumference which undergoes the maximum change in bending stress. The following formula, applicable to gages spaced  $120^\circ$  apart, was developed to permit rapid calculation of the maximum stress change:

$$\Delta B_{\max} = \frac{\sqrt{2}}{3} E \sqrt{(\Delta 1 - \Delta 2)^2 + (\Delta 2 - \Delta 3)^2 + (\Delta 3 - \Delta 1)^2}$$

where

$\Delta B_{\max}$  = maximum change in bending stress, psi

$E$  = Young's Modulus

$$\Delta 1 = S_1 - s_1$$

$$\Delta 2 = S_2 - s_2$$

$$\Delta 3 = S_3 - s_3$$

by definition

$s_1, s_2, s_3$  = initial strain gage readings

$S_1, S_2, S_3$  = strain gage readings under load

The direction of this change in bending stress is given by:

$$\cos \theta = \frac{\Delta 3 - \Delta 2}{\sqrt{3} \times \Delta B_{\max}}; \quad \sin \theta = \frac{2\Delta 1 - \Delta 2 - \Delta 3}{3 \times \Delta B_{\max}}$$

where the angle  $\theta$  is measured relative to gage 1, as in fig. 3.

Changes in bending stress, and to some extent in tensile stress, can be reduced by strengthening the rod and cap in the fastened area—especially by adding section thickness to the outer surfaces if clearances permit.\* If not too large, stress variations may be offset by using stronger bolts.

Material analyses, and problems inherent to processing such as residual stresses, may for convenience be considered in a category separate from design.

For instance, postwar developments have called for a review of the economies of the alloying elements in steel. As a result research has been directed toward the use of leaner and less expensive alloy steels.

In testing regular v. experimental steels in a part such as a connecting rod, any full-section tests such as simulated service fatigue, are complicated by variations in section which may be expected from different sets of forging dies, and even from the same set as it wears. There is also machining variance within tolerances. Consequently, a standardized test loading may result in certain shifts of stress concentration of the part. Fig. 5 shows the variation in the location of initial fatigue failure that can result. By determining this shift beforehand with brittle lacquer and strain gages,

*\*Similar observations have been made by C. Lipson, "Strength Considerations in Bolt Fastening Design," Proceedings Soc. Experimental Stress Analysis, vol. I, No. II, 1944, p. 101.*

and by adjusting the load to compensate for it, the unit stress at the concentrations can be brought into line to make the simulated service more strictly indicative of the steel being tested, as shown in fig. 6.

A good deal of attention is being directed toward the determination of residual stresses, especially in hardened steel components. In the extensive research program of induction hardening of gears at the International Harvester Co., the effect of these stresses upon simulated service performance is being investigated.

The simplest approach to residual stress mea-

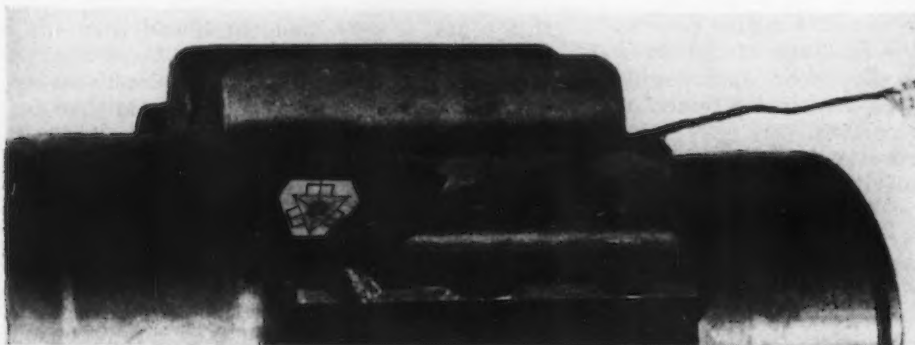


FIG. 7—Arrangement of strain gage rosettes for measurement of residual stress by drilling is shown in the diagram below. Photo shows a rosette in place on a  $2\frac{1}{2}$  pitch gear. Larger dimensions would defeat the purpose of obtaining localized data.

Let  $P$  and  $Q$  be the principal stresses before the hole is drilled and let  $\phi$  be the angle specifying their direction.

If  $R_1, R_2$  and  $R_3$  are the changes in the gage readings on drilling, then for a  $120^\circ$  rosette:

$$P + Q = -\frac{F}{3} (R_1 + R_2 + R_3);$$

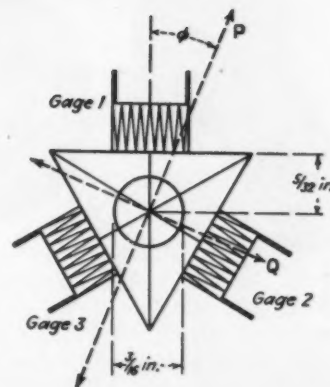
$$P - Q = -\frac{\sqrt{2} G}{3} \sqrt{(R_1 - R_2)^2 + (R_2 - R_3)^2 + (R_3 - R_1)^2}$$

$$\tan 2\phi = \frac{\sqrt{3} (R_3 - R_2)}{2R_1 - R_2 - R_3};$$

$2\phi$  has the same sign as  $R_2 - R_3$ .

For a rosette of the dimensions shown here and type A-8 gages, the values of  $F$  and  $G$  are:

$$F = 10^8 \text{ psi}; \quad G = 8.6 \times 10^7 \text{ psi}$$



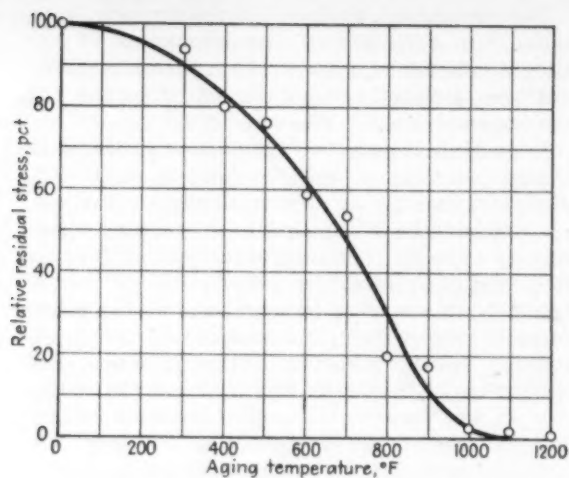


FIG. 8—Relative residual stress of C-1035 cold-headed bolts, double extruded, after aging at temperature shown on abscissa for 1/2 hr. followed by air cooling.

surement has been to apply strain gages, preferably in rosettes, to the region of interest and to completely relieve the stress there by extensive sectioning. The final result is a thin slice of metal containing the gages. The gages record both the stresses which are relieved and those induced by the sectioning. The latter, it has been determined, will affect the gages in inverse proportion to the thickness of the slice and can be reduced by subsequent careful removal of metal from the cut surface; e.g., by honing.

An alternative method, with some advantages of convenience, is to partially relieve the stress by drilling. Fig. 7 shows a hole drilled into a gear tooth at the center of a strain gage rosette. From the change in the readings of the three gages, on drilling, the directions and magnitudes of the two original principal stresses in that region can be calculated.

The utility of the rosette depends upon its compactness and sensitivity which in turn de-

pend upon the dimensions of the drilled hole, of the rosette triangle and of the direction of the gages, whether radial or circumferential. A satisfactory combination of reasonable compactness was found to be as follows: (1) Drill size, 3/16 in.; (2) direction of gages, relative to hole, radial at 120°; (3) type of strain gages, A-8 Baldwin Southwark SR-4; and (4) distance of strain gages from center of hole, 5/32 in.

A smaller drilled hole would necessitate using smaller, and incidentally less accurate, A-19 gages which have a  $\pm 5$  pct accuracy compared with  $\pm 2$  pct for the A-8 type.

The smaller hole is also inherently more sensitive to inaccuracies of drilling. Roughly, the stress which is relieved by drilling depends upon the area ( $\pi r^2$ ) of the hole, and the effect of the layer cold-worked by drilling is proportional to the circumference of the hole ( $2\pi r$ ). The latter effect is, therefore, relatively less important the larger the hole. The photograph in fig. 7 shows a 2 1/2 pitch gear and illustrates the undesirability of using larger dimensions which would defeat the objective of localizing the study.

A disadvantage of this method is lowered sensitivity. The rosette described above has an efficiency of about 25 pct; that is, actual residual stresses of 40,000 psi will measure 10,000 psi on the gages.

Residual stresses have also been studied by means other than strain gages. For example, fig. 8 shows the effect of stress-relieving temperature upon the residual stress of cold-headed bolts. In this case the bolts were slit on a bandsaw as shown in fig. 9, and the resulting change in dimension  $A$ ,  $A'$  was measured. In order to increase the sensitivity of the tests, slits  $a$  and  $b$  were made first, and then slit  $c$  was made perpendicular to  $a$  and  $b$  and slightly above center. Sectioning of completely stress-relieved bolts in this manner showed that any stresses which may have been introduced by the cutting had a negligible effect at the hardness level of these bolts.

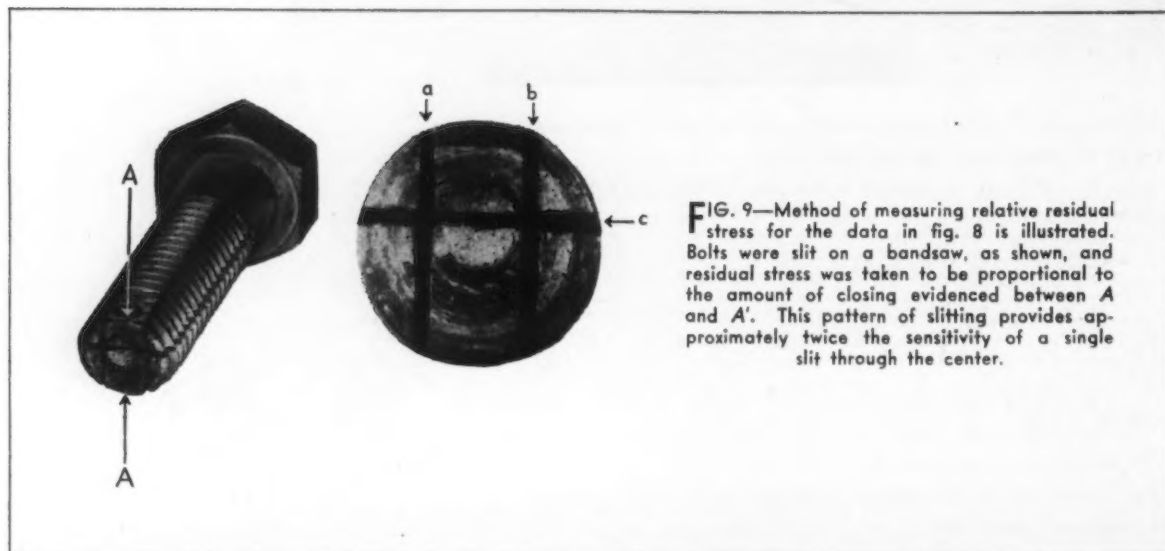


FIG. 9—Method of measuring relative residual stress for the data in fig. 8 is illustrated. Bolts were slit on a bandsaw, as shown, and residual stress was taken to be proportional to the amount of closing evidenced between  $A$  and  $A'$ . This pattern of slitting provides approximately twice the sensitivity of a single slit through the center.

# New Developments Widen Metallizing Uses

By JOHN E. WAKEFIELD  
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*Several recent developments in metallizing materials and techniques, plus a better understanding of the structure and properties of sprayed metals, have expanded the field of metallizing applications. The author discusses these developments and cites various examples of the effective use of metallizing. The lubricating properties of sprayed coatings are also discussed in detail.*

THE advantages of sprayed metal deposits have been accepted generally in the repair and salvage of certain worn parts, and the process has recognized possibilities in new machinery design. The lubricating qualities of such deposits are excellent because a metallized surface is porous and will absorb and hold appreciable quantities of oil, running with less friction than the same metals in cast or wrought forms. In the manufacture of textile machinery, for example, oil must be used sparingly so that it won't get into and spoil the yarn, thread or fabric being manufactured. Metallizing has been used for repair for such parts as calender roll journals, and, when these deposits are soaked in oil and graphite, they give far longer life than original equipment.

Similarly, sprayed metals have excellent resistance to wear and corrosion. Applications where these factors are important include rebuilding pump packing sleeves, piston rods, rolls and other such parts. Typical of such applications was rebuilding a set of bronze sleeves for an eastern power plant. The sleeves, 4 in. diam x 14 in. long, were scored and worn for about 8 in. of their length. Rebuilt by metal spraying, as shown in fig. 1, they outlasted bronze sleeves by more than 3 to 1 on last inspection, and the original packing was still in the glands. This repair operation using high chromium-high carbon stainless spray metal, cost about \$8 each to restore the sleeves. New sleeves cost \$44 each

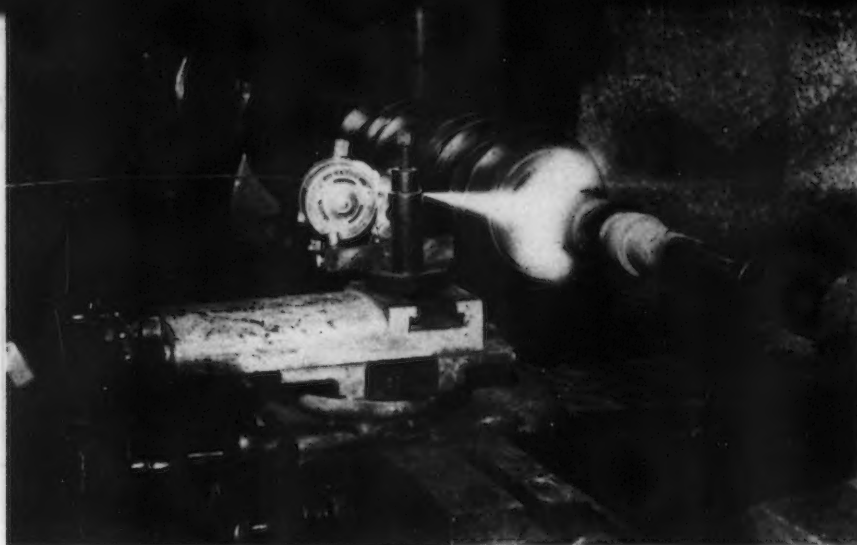
at the time the work was done, and the plant had obtained a price of \$169 each for new stainless steel sleeves.

In the past three or four years, intensive research has been carried out on sprayed metals themselves. Out of this program has come a greater knowledge of the structure and physical properties, which, in turn, have pointed the way to better techniques and to the development of metals especially for metallizing; metals with better characteristics than those available before research started.

So far, the research program has been responsible for the development of three new materials and two new techniques. One material, a new aluminum-iron bronze is a considerable improvement over previous bronzes. It was developed for greater wear resistance, strength and machinability. Its tensile strength, after spraying is 30,000 psi, almost twice that of any previous metallizing bronze. Similarly, its wear resistance is almost twice as great and approaches that of cast iron. It attains a high finish with almost any shape of tool.

The other two materials have led to new metallizing techniques. Early in 1948, it was discovered that an alloy high in molybdenum would bond itself when sprayed with an ordinary metallizing gun to a smooth, even highly polished surface, provided that it was perfectly clean. This discovery changed the aspect of preparation for





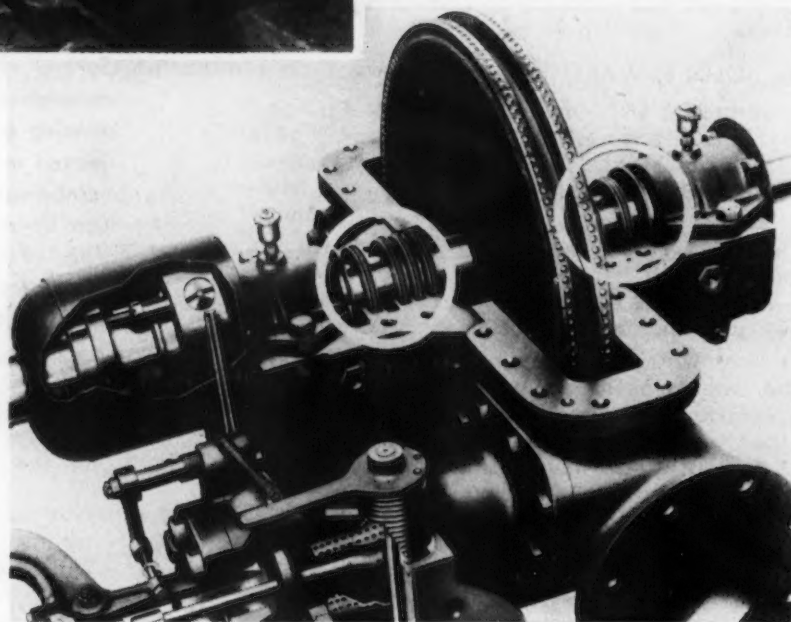
#### ABOVE

**FIG. 1**—Bronze sleeves built up by metallizing, outlasted regular bronze sleeves by 3 to 1. The sprayed metal was a high chromium-high carbon stainless steel.

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#### RIGHT

**FIG. 2**—The shaft area enclosed in the two circles of this type C single stage Westinghouse turbine were metallized with high chromium-high carbon stainless. The use of sprayed metals in the manufacture of new equipment is becoming increasingly widespread.



metallizing on many mechanical parts. Furthermore, it has opened up new application possibilities.

The new material will not bond to copper or its alloys, but does adhere firmly to steels, stainless steels, Monel, nickel, iron, magnesium and most aluminum alloys. Instead of the elaborate undercutting, grooving and knurling method used to prepare the turbine shaft in fig. 2, a good bond can be provided as shown in fig. 3. Coating may be tapered off at the ends as shown, an operation that previously had not been considered safe. Instead of grooving and knurling, a light fast roughing cut is all that is necessary. It cleans the surface by exposing bright clean metal, and is a much faster operation to perform.

The material itself is expensive, running from \$9.00 to \$10.00 per lb. However, only 0.0015 to 0.002 in. is needed as an undercoat for other sprayed metals. Hence, savings in machine time more than offset the cost of the undercoat material. On the average, the method reduces the overall cost of metallizing operations on most shafts by about 40 pct.

The method can be recommended safely on continuous surfaces such as packing or bearing areas. However, it is not recommended on inter-

rupted surfaces such as shafts with keyways where a heavy build-up is needed. Here, stress concentrations on the bond or interface may become excessive. The white section shown in fig. 4 is the self-bonding undercoat. It has a very close adhesion to the mild steel base and shows evidence of actual fusion over part of the area.

The third new material of importance is one developed for hard-facing. It is a rather interesting material in that the alloy itself was originally available only in powder form. To make it usable

in the metallizing gun, the alloy is mixed with plastic and extruded into a plastic rod or wire. When sprayed, the plastic volatilizes completely, so that only the metal alloy particles are deposited on the work.

This material has led to a new process called Spraywelding, so named because it combines the advantages of both metallizing and welding. By spraying the material, a much more uniform deposit is obtained, saving considerable of the expensive hard-facing alloy. Then the deposit is heated, with torch or in a furnace, which fuses it to the base and forms a hard, dense, homogeneous surface. Sprayed hard-facings are entirely free from porosity. Furthermore, the uniformity of the sprayed and fused deposit reduces finishing time.

Fig. 5 shows some pump parts treated with this new method. With a little extra care on parts such as these, finishing is entirely eliminated. A recent report from Texas reveals that oil pump rods Spraywelded stood up for 573 hr, whereas the original monel rods, used because of the acid condition encountered, had to be replaced every 24 hr. The sprayed hard-facing withstood the acid condition even better than monel and resisted the highly abrasive conditions. Packing, which

was previously replaced every 8 hr, lasted 60 hr on the Spraywelded rods.

Little has been known about what happens to sprayed metal particles after they leave the metallizing gun beyond the fact that they flatten out when they land. Research has shown that a combination of physical inter-locking and what is called oxide cementation bonds the particles. Both are shown quite clearly in fig. 4, which is a photomicrograph of sprayed 0.10 pct carbon steel on a mild steel base. The white section is a new material, used as an undercoat.

Metal leaves the metallizing gun in the form of a molten globule or spheroid, covered by a thin oxide film. A particle is still molten when it lands and, because of its heat and the velocity at which it travels, it flattens out. This greatly increases its surface area and ruptures the oxide film, exposing pure metal. The pure metal bonds itself firmly to the oxides formed on the particles that had landed previously.

Hence, the structure is now known to consist of metal particles, surrounded by thin films of oxide, and actual voids between particles where they have not bonded completely to previous particles, as shown in fig. 4. These voids permit the oil to penetrate the sprayed metal and act as reservoirs. As surface oil is used up, more is drawn from the deeper pores. The effect is like that in a bearing made of powdered metal. In laboratory tests, it has been found that a metallized shaft operating at 261 fpm under a load of 300 psi continued to run for 23 hr after the oil supply was deliberately cut off. A hardened steel



ABOVE

**FIG. 3**—With the new molybdenum metallizing alloy, grooving, knurling and undercutting preparation is not required, but the coating may be placed over a light, fast roughing cut. Coatings may also be tapered off at the end as shown, an operation that previously had not been considered safe.

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RIGHT

**FIG. 4**—The porous structure of sprayed metals is shown here. The oxide covered metal particles have voids between them, permitting oil to penetrate and providing an escape for minute metallic particles dislodged during the breaking-in of a shaft.

shaft seized after only 3 hr under the same conditions.

Another reason for reduced friction in sprayed surfaces is that surface pores provide an escape for the minute metallic particles invariably dislodged in wearing-in shafts. Between this factor and the lubricating qualities, it is understandable that sprayed babbitt, for example, shows a coeffi-

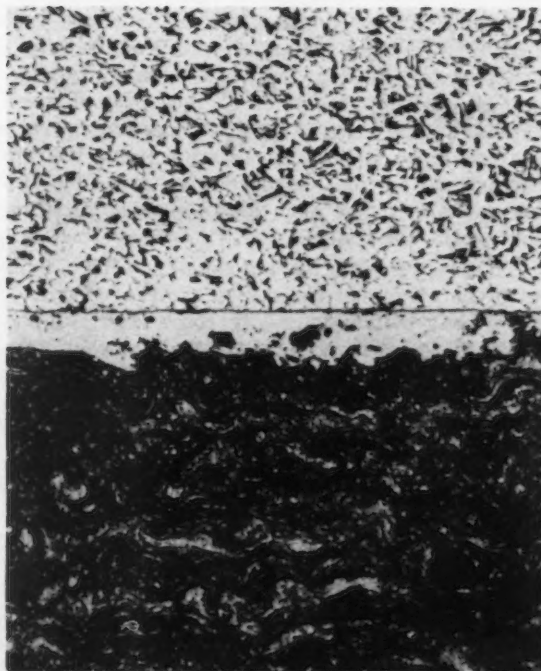
TABLE I

Comparison of Coefficients of Friction on Sprayed and Hardened Steel Shafts Operating in White Metal Bearings at Three Different Speeds

Loads, Psi	Plain Oil		Colloidal Graphite Oil	
	Hardened Steel	Sprayed Steel	Hardened Steel	Sprayed Steel
	445 fpm			
250	0.0107	0.0030		0.0021
300	0.00635		0.00255	
400		0.0095		0.00675
500	0.160			
550	0.0201	0.0124	0.0200	0.0097
700		0.0152		0.0117
900	0.0286	0.0174		0.0132
1000	0.02175	0.01865		0.0136
1200			0.02375	
1250		0.0184		0.0136
1400		0.0174		0.0128
1600		0.01785		0.0120
1850		0.0184		0.0112
2000		0.0179		0.0103
	261 fpm			
200		0.0067		0.0057
250	0.0061		0.0076	
550	0.01315	0.0111	0.01175	0.0098
750		0.0147		
800	0.0169			
850			0.0112	0.0102
1000	0.0183	0.0149		
1150			0.0093	0.0078
1250	0.0176	0.01525		
1450			0.00865	0.0061
1500		0.0140		
1550	0.0160			
1750		0.0152		
1800	0.0156		0.0074	0.0039
2000	0.0153	0.01505	0.00745	0.0029
	27 fpm			
200	0.0102	0.0745	0.0088	0.0057
550	0.02485	0.0195	0.0209	0.0175
800	0.02475	0.0182	0.0202	0.0156
1000	0.0276	0.01875	0.0222	0.0182
1300	0.0318	0.0200	0.02525	0.0169
1600	0.03125	0.02025	0.0250	0.0161
1750	0.0331	0.02125	0.0265	0.0147
2000	0.0352	0.0220	0.0292	0.0143

cient of friction of 0.0084 at 1000 fpm where cast babbitt at the same load and speed shows a coefficient of 0.0107. Similarly, seizure load of sprayed babbitt amounted to 7040 psi where cast babbitt seized at 5760 psi.

The results of tests at various speeds and dif-





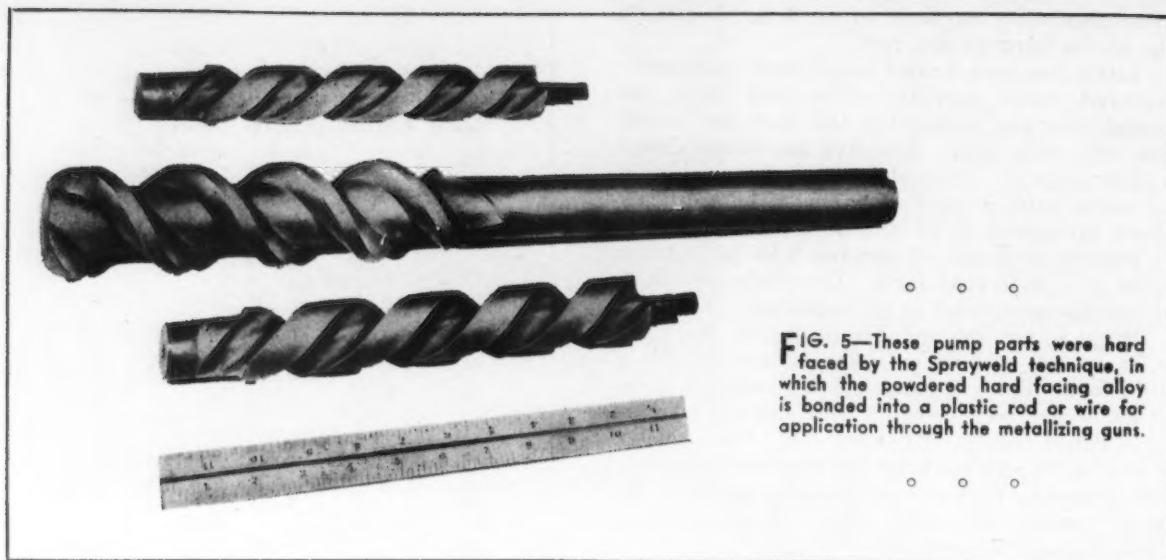


FIG. 5—These pump parts were hard faced by the Sprayweld technique, in which the powdered hard facing alloy is bonded into a plastic rod or wire for application through the metallizing guns.

ferent leads are presented in table I. Data shown indicate possible applications of sprayed metals to critical sections of spindles, boring bars, journals and other parts where lubrication needs improvement and friction could be reduced to advantage.

A common gage of the wearing qualities of a metal is its hardness. In sprayed metals, hardness tests seldom mean much except for comparison between one sprayed metal and another. Most hardness tests depend on penetration for measurement. With voids already existing, such tests are misleading. For example, a coating of sprayed high chromium-high carbon steel shows a hardness reading of 33 Rc particle hardness while wrought stainless steel of this type runs up close to 55 Rc.

Wear resistance of sprayed metals comes from a combination of particle hardness and lubricating qualities. That is why a large Eastern railroad found that sprayed 0.80 pct carbon steel stood up better on diesel switcher crankshafts than a chromium plated surface. Chromium is considerably harder, but lacks the lubricating and oil-holding properties of the sprayed metal. Similarly, there are likely many mechanical parts that could be manufactured from mild steel and the critical sections sprayed with a harder, better wearing metal such as high chromium-high carbon stainless steel.

To date, research has not concerned itself much with the corrosion resistance of sprayed materials. That will undoubtedly come later. In the meantime, it is fairly obvious that sprayed stainless steels, bronzes and the like will have properties similar to what they offer in other forms. The one questionable factor is the porosity that exists in the sprayed metals.

Porosity certainly exists, but it is not a source of trouble on most mechanical parts for two reasons. First, it is advisable to apply fairly heavy coatings on shafts, rolls, bearing and packing surfaces. A surface on which maximum allowable wear is 1/16 in. on the diameter, for example, should have a coating of at least 0.050 in. on the radius, so that some sprayed metal will

remain after normal wear has occurred. Such thicknesses tend to produce a labyrinth type of seal that effectively prevents penetration of the corrosive element to the base.

In the second place, it is quite a simple matter to seal coatings where corrosion is the principal condition they must withstand. Raw tung oil and either raw or boiled linseed oil work quite

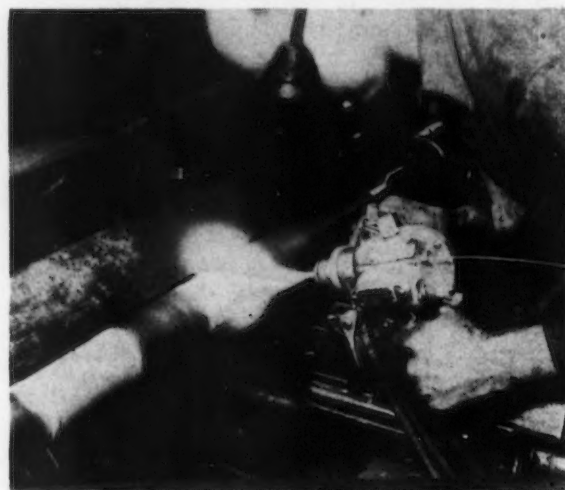


FIG. 6—Shown here is a Westinghouse turbine shaft being metallized, using a high chromium-high carbon stainless steel. It takes about 1 lb of sprayed metal per shaft to metallize it, whereas if made completely of stainless steel, about 60 lb would be required.

well. The oil should be mixed with 5 pct by volume of cobalt liquid drier. Procedure is to dip or paint the work while still warm after spraying.

Fig. 2 illustrates how these various characteristics of sprayed metals are being put to use in the manufacture of new machinery. This is a type C single stage Westinghouse turbine, showing where the shaft is metallized with high chromium-nickel stainless steel. It takes about 1 lb of sprayed metal per shaft to provide long-wearing, corrosion-free gland zones. If the shafts were made entirely of stainless steel, about 60 lb of this material would be needed; production time



would be increased because of the difficulty of machining this material. Fig. 6 shows one of the shafts being metallized.

It appears that metallizing has some very definite possibilities for manufacturers of machinery. Obviously, its best possibilities are where certain limited sections of shafts, journals, spindles and the like are subjected to unusual wear, lubrication or corrosion conditions. The parts themselves can be fabricated from mild steel or similar material and the critical areas protected as desired.

It has already been pointed out that in certain industries, notably the textile industry, lubricants must be used sparingly because of the danger of spoilage of the product, and in such applications metallizing can help solve these lubricating problems. Lickerin roll journals, calender roll journals, and the journals of almost all textile rolls can be protected.

Beater roll journals in paper mills wear badly, and can be protected similarly. Compressor parts present something of a problem. Piston rods and crankshafts are subject to wear on limited areas where excellent lubrication is important.

A Western plywood plant reported that they undercut and metallize new pump packing sleeves before placing their pumps in service. They have found sprayed high chromium-high carbon stainless steel sleeves stand up much better than those provided by the pump manufacturer.

Impeller hubs are subjected to wear and erosion. In some instances it seems practical to metallize hubs with a material that will withstand these actions better. Fig. 7 shows just such an operation performed as a repair.

A great deal of work has been done with metallizing on hydraulic press rams. Made of cast iron in many cases, the surfaces are damaged so that packing can no longer be kept tight. Faced with repairs or replacement the user turns to the manufacturer who often recommends chrome plating the ram. Chromium is hard without doubt, but it is also tremendously expensive to plate more than about 0.010 in. of chrome. At that thickness, the plated coating is not thick enough to withstand much action. Hence, one often sees rams with scores clearly visible in spite of the plating. Plastics and rubber manufacturers par-

ticularly spray worn rams with high chromium-high carbon stainless steel, applying about  $\frac{1}{8}$  in. on the radius. There's enough body of the coating to stand considerable abuse. The stainless is hard enough for all practical purposes, and it is less expensive to metallize.

In the power field, there are many valve stems subjected to wear and corrosion. Standard practice is to sleeve the critical areas with bronze sleeves, sweated on. It is slow, tedious and expensive, and the stem itself has to be designed with a reduced diameter to allow for the thickness of the sleeve. The stems could be designed for a  $\frac{1}{8}$  in. thickness of stainless steel sprayed or metallized bronze. The stems could be heavier in section, and stronger, and they'd still be protected. One West Coast manufacturer is employing metallizing instead of sleeves, using the new aluminum iron bronze.

One of the greatest money saving and quality producing applications for metallizing is the surfacing of roll bodies. Rolls are used in many industries, from printing and lithograph, asphalt roofing materials, paper, textile, chemical processing and others. They are subject to wear, abrasion, corrosion and sometimes all three, and usually expensive.

One western asphalt roofing material manufacturer made some rolls out of iron pipe, with the ends plugged and journals inserted. Each roll cost about \$200. Because of corrosion of the surface, it was decided to try stainless steel rolls. To make them from stainless steel tubing instead of iron pipe would have cost about \$600 per roll. By metallizing iron pipe rolls at a total cost of \$300, the necessary protection has been obtained.

The discovery of the self-bonding undercoat opens possibilities for the use of magnesium. This material has been limited in mechanical use because there has been no good method of providing it with a good wearing surface. The self-bonding undercoat bonds firmly to it, and provides an excellent surface for the application of other sprayed metals. Now it is possible to coat magnesium parts with high chromium-high carbon stainless steel or high carbon steels. This discovery alone seems likely to expand the use of magnesium considerably.

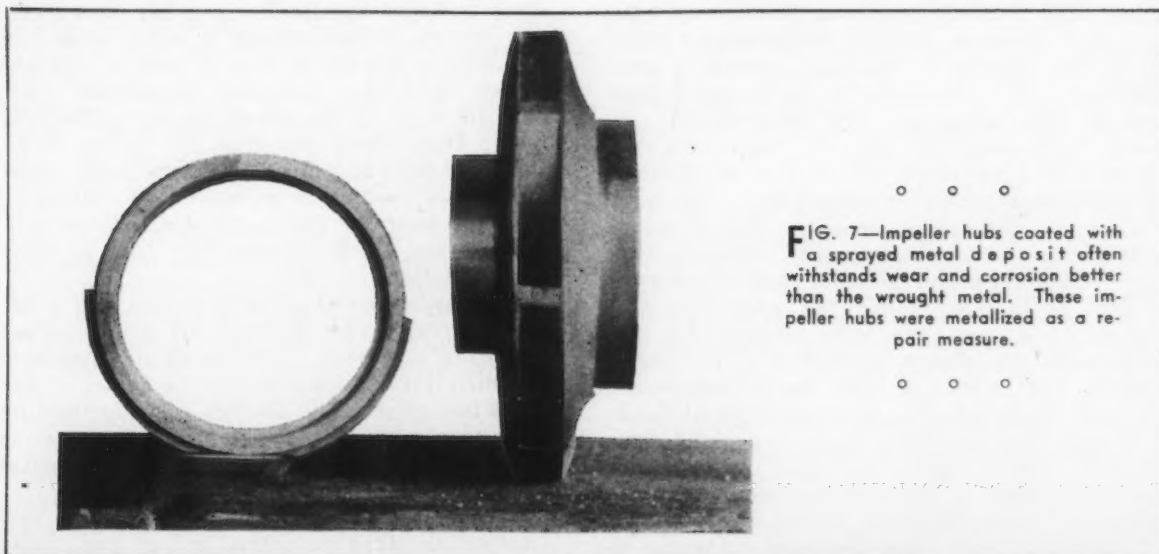
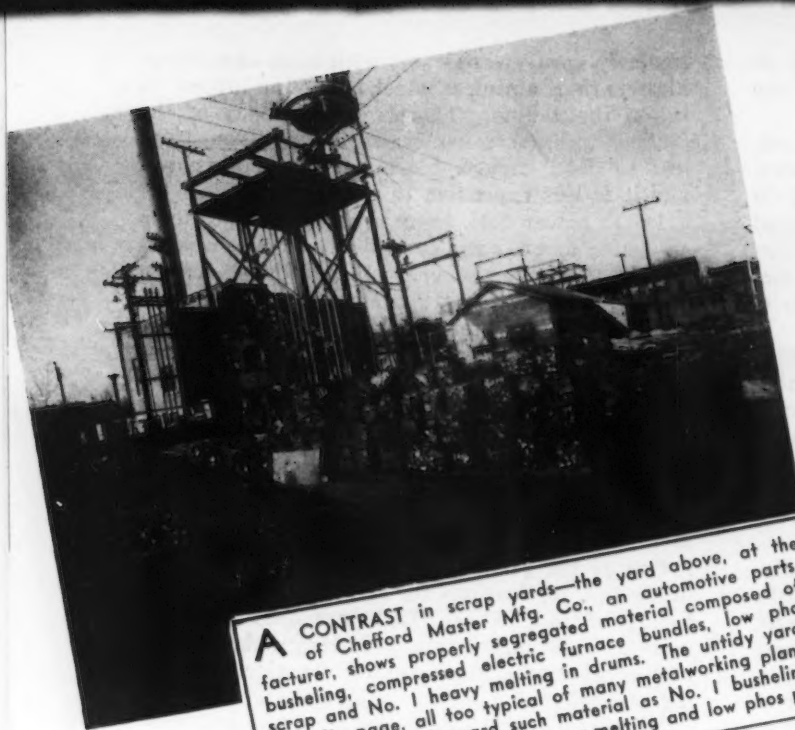


FIG. 7—Impeller hubs coated with a sprayed metal deposit often withstands wear and corrosion better than the wrought metal. These impeller hubs were metallized as a repair measure.

# ... Profits

By JAMES FLETT

President,  
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**A** CONTRAST in scrap yards—the yard above, at the plant of Chefford Master Mfg. Co., an automotive parts manufacturer, shows properly segregated material composed of No. 1 busheling, compressed electric furnace bundles, low phos plate scrap and No. 1 heavy melting in drums. The untidy yard on the opposite page, all too typical of many metalworking plants, shows heaped around the yard such material as No. 1 busheling, industrial baling clips, No. 1 heavy melting and low phos plate.

**“W**ORN out, unused or unusable material, machinery, and equipment must be reborn in America's furnaces, smelters, and refineries. Only by this method can we obtain sufficient raw materials required to produce urgently needed armament . . . It is the waste materials of one plant that provides raw materials for another.” — so said WPB seven months after Pearl Harbor.

Today nobody knows how close we are, or how far we are, from a second all-out war production program. But this much is sure—there has never been a time when it was a greater national risk to waste raw materials than it is now.

Even assuming that hopes are borne out and there will be no further war production, this country's reserves of vital materials are critically low. Before the war management in general paid little attention to the scrap it produced. The individual firm depended on its local scrap dealer to haul the mixture away. Within the plant there was little or no thought given to segregation or preparation. One kind of scrap contaminated another. Scarce alloying agents were lost altogether. Manufacturers did not dream of the cash values they were failing to realize. When the war came and conservation was the goal, blame for the deplorable situation was directed to the scrap dealer, but usually it was the manufacturer and not the dealer who was primarily at fault.

For example, it was found that plants machining both 2S and 24S aluminum were taking no precautions to maintain the identity of the grades of scrap produced. Indeed, when selling the materials they were not even bothering to

advise the purchaser, the scrap dealer, for the analysis involved. The result was inevitable, much 2S in these instances became merely part of a diluted 24S. Both the war effort and the manufacturer suffered. The latter received a price which was well below the real value of the materials.

World War II has been called a war of alloys. Steel for armaments contained nickel, molybdenum, chromium, cobalt, vanadium, tungsten and other alloys in varying concentrations and in all manner of combinations. Some of these were and still are scarce. After the war the progress made toward efficient conservation suffered from a natural letdown. During the reconversion period the identity of much alloy scrap was lost. Inevitably there has been a certain amount of “smuggling” of alloy steels into the mills which are in urgent need of straight carbon steels for peacetime production. Not only are some of the alloys lost but difficulties result from their presence in carbon steel. Damaged tools and dies sometimes result. Steel tonnage is needlessly rejected. The situation is one reason for the heavy demand for railroad scrap which is relatively free of alloy contamination.

A manufacturer had been getting \$12 a ton for his scrap. This included five distinct types all mixed together. Considering the condition in which it was turned over to the dealer, it was not a bad price. The dealer's costs for sorting and preparing this conglomeration were so very high that he was not making a normal profit.

Scrap engineers found that with a few changes in plant procedure and at practically

# in Scrap . . .

*Despite the lessons learned during the recent war, many metalworking plants still persist in treating scrap metal as Saturday's child and ignoring the profits to be had from efficient scrap handling methods. The author outlines the fundamentals of an intelligent scrap program and cites examples of methods which have enabled many plants to not only realize profits on the scrap they generate, but to contribute substantially to conserving a vital raw material.*



no cost, proper segregation of the various kinds of scrap could be attained and the material would leave the plant under four classifications for which prices are regularly published. No sorting would be needed in order to meet the specifications of consuming mills. The plan was put into effect and immediately the manufacturer began receiving prices which averaged \$30 a ton, instead of \$12, an increase of no less than 250 pct. His tonnage was not large but this increase meant a net revenue increase to him of hundreds of dollars per month. It also meant the conservation of manpower on the part of the dealer.

In another, larger plant, aluminum clips worth 17¢ a lb were being produced in a building which turned out only this kind of scrap. But in the salvage yard about 1000 yds away, the clips were mixed with steel sheet clippings bringing, at the time, 13¢ a lb. In the same scrap pile was found a quantity of electric furnace type scrap of a going value of 2¼¢ a lb. For the unprepared scrap which resulted from the mixture, the firm was receiving 1½¢ a lb.

In this case the increase in net revenue from the program was startling. Every month the plant was producing 30 tons of the low phos, 5 tons of aluminum, and 215 tons of the steel clips. After the segregation program started the company's scrap revenue jumped from an average of \$7500 to \$10,575 a month, an increase of just under \$37,000 a year.

The waste material industry can be called an industry of hidden values. That is the average buyer of any kind of scrap doesn't always disclose to the seller the ultimate value of the

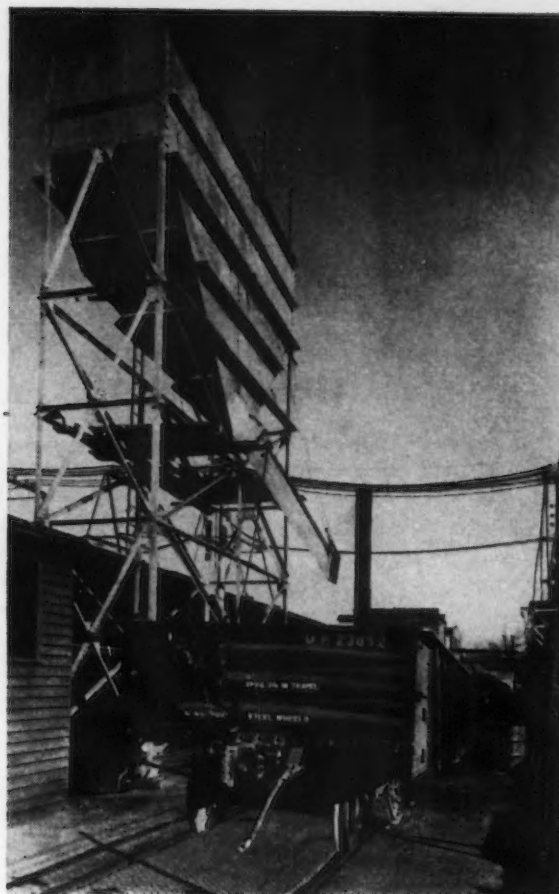
material and the proper classifications in which it falls to bring the highest market values. Nor does he usually furnish any engineering experience to help a producer of scrap turn out a better article from the consumer's point of view.

Yet through many years of experience in all kinds of operations it has been found that in an industrial plant it is just as easy to segregate most scrap at the point where it is produced in such a manner that it will arrive at the shipping platform unadulterated and of proper classification for sale and re-use.

In view of this fact it seems perfectly ridiculous to see a manufacturer who has the men, buildings, equipment and know-how to build his product, apparently unable to utilize a by-product efficiently. Why can't the same people who make the concern's main product make scrap which also will satisfy a market? If the manufacturer does so, is he not entitled to the increase in revenue he receives? Think of the laborious job of sorting he saves the dealer.

Scrap should be segregated at the source, that is, different kinds and grades should be kept separate so that sorting will be kept to a minimum. In the large plant this may mean that scrap from a big department must be kept separate from that of other departments. In smaller plants machines working different materials may stand side by side and an orderly and easy system must be set up so that the scrap from the machines will not become mixed. Scrap receptacles clearly marked for the kind of scrap they receive is the almost universal and obvious solution to the problem. Some machines are used to work a variety of metals.





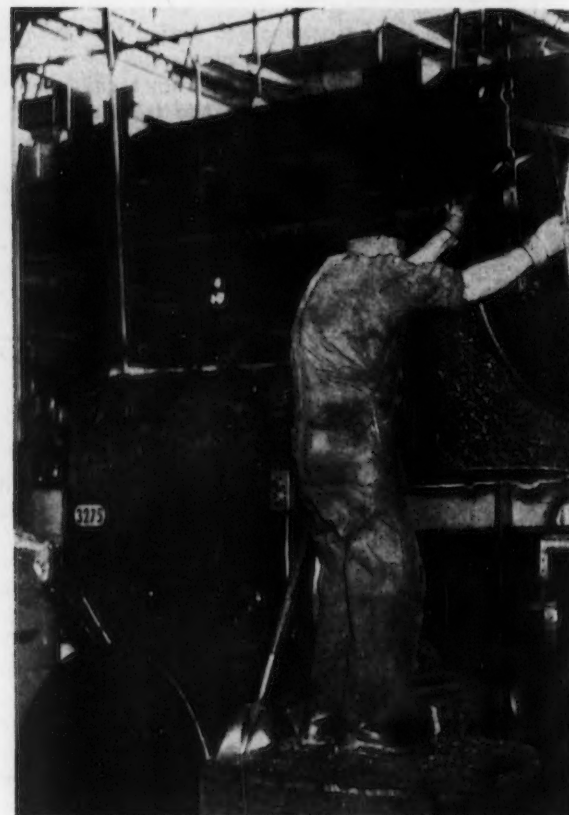
In this case it is necessary to clean a machine before changing from, for example, steel to brass. Then the ferrous and nonferrous scrap will not contaminate each other and so subtract from the value of both. The general rule is that an admixture of metals usually brings less than the going price for the least valuable constituent.

Once the segregation system is in operation the big problem has been solved, but care in subsequent operations must be maintained. Some scrap must be further prepared to meet the requirements of the consumer. On presses, for example, not only must scrap be kept separate, but cut-offs can be used in many instances to make scrap properly classified, say, as No. 1 factory busheling, ready for use by the steel mills. Scrap resulting from the same steel and the same presses not equipped with cut-offs has to be either sheared or hydraulically compressed prior to shipment. Such preparation, however, is generally not for the small plant; even in large ones it is sometimes a close decision whether the company can afford to equip itself with cut-offs, shears, and baling presses or whether it is better to let the dealer perform these jobs.

Proper handling of scrap on its trip from the machines to the storage area is just as important as segregation. The example was cited of the factory where segregated aluminum clips were transported to a salvage yard and there dumped into a pile consisting of sheet clippings

and low phos steel. Many cases have been found where copper has been collected in one container in the plant and brass in another. Yet when the time came for removal, the contents of both dumped into a single buggy. In plant after plant materials originally segregated and prepared have been thrown together, resulting in unprepared grades. In such cases the company actually paid men to destroy the value of its property.

Marketing scrap is a complex operation if the company hopes to realize the top dollar.



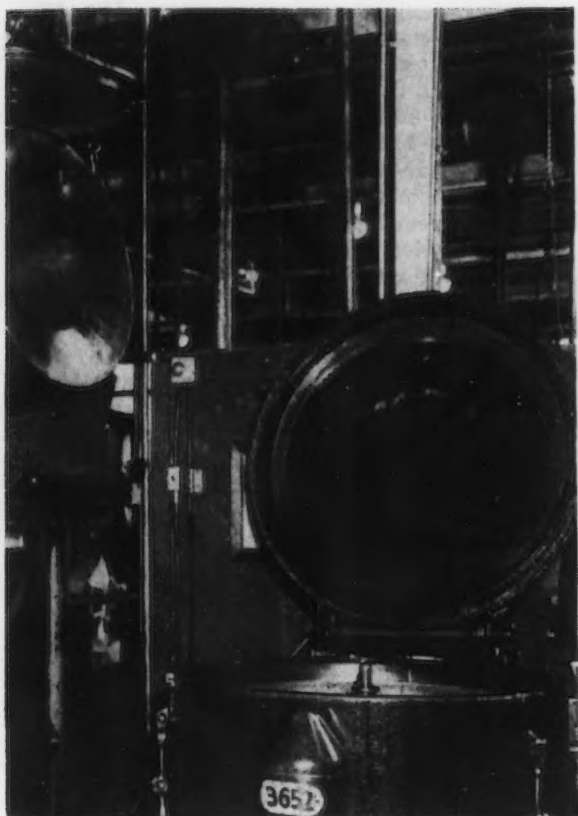
**M**AIN features of a modern system for handling a large volume of turnings are the centrifuge where oil is removed, the crusher into which the turnings are shown being fed, and an 8-in. pneumatic tube for moving

There are about 75 recognized grades of ferrous scrap, hundreds of grades of nonferrous scrap, and almost an infinity of miscellaneous by-products of value to be found in industrial plants. The miscellany includes chemicals, paints and enamels, oils and greases, textiles, paper, boxes, barrels, drums, kegs, rubber, rope, etc., each, incidentally, with its own variety of grades.

One concern was already doing a creditable job with its metals, but a scrap engineer saw a bonfire burning out at the side of the power house. Investigating, he saw a workman feeding paper into the fire. "Is that all he does?" the engineer asked. He was told the man was kept busy doing nothing but that. The engineer looked further into the matter and dis-

covered that the company was paying the man to burn \$500 worth of paper a month.

In the marketing of scrap many companies pile the complicated task of scrap sales on an already over-burdened purchasing agent whose principal responsibility is buying supplies. He is expected to perform the added task with his left hand some time during the day when important business lets up. Even granting that he may be the unusual employee who, under these handicaps, will really make a study of the certain kinds of scrap the company produces, it is



crushed turnings to a storage hopper. The hopper, shown in the illustration at upper left holds about 75 tons of turnings and permits loading a car with 35 to 50 tons in 7 to 10 min.

impossible for him to be expert in all kinds at any given time. He can't be familiar with the internal production of scrap, but has to dispose of what arrives at the shipping dock as best he can.

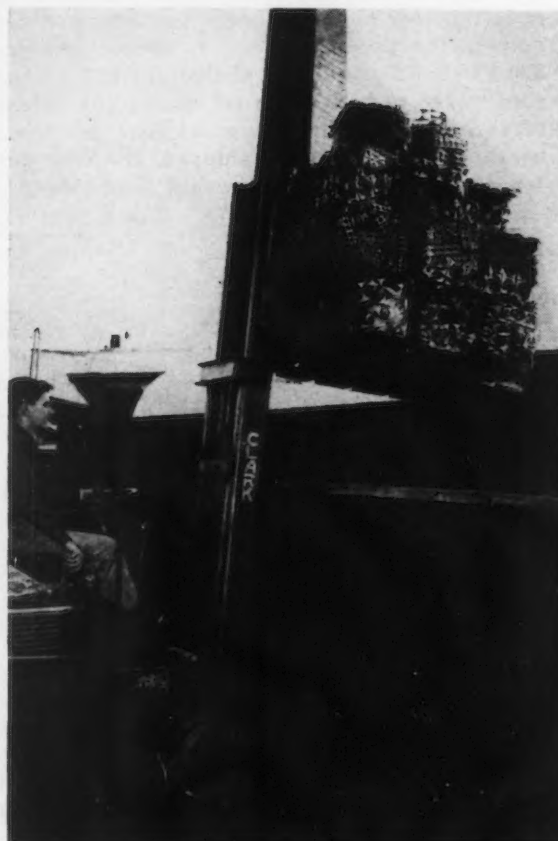
This point is of extreme importance. A concern customarily disposed of 12 grades of scrap each month. By instituting some additional segregation, 16 grades were sold the first month the change was made. In the second month of operation 21 grades were sold. The concern is a sizable one and the work of setting up a truly efficient segregation and marketing system is not yet completed. However, prior to that, the company was realizing an average revenue from all of its scrap of just over \$1100 a month. During the first

month under the new system the revenue jumped to just over \$1700 (with no production increase), and in the second month it reached more than \$3300, still with no production increase.

At the end of the second month the following grades were being marketed: carbon steel stampings, steel turnings, cast iron borings, aluminum clips, scrap aluminum castings, cast iron, angle iron cut-offs, galvanized sheet clips, aluminum borings, die cast borings, die cast solids, yellow brass borings, red brass borings, nickel plated brass, plated copper wire, copper tubing cut-offs, mixed paper, barrels, usable steel dropoffs, usable aluminum dropoffs, and miscellaneous plant maintenance scrap. On this account the indicated yearly net increase in salvage revenue to the concern is just under \$25,000.

A full engineering approach often can and should be used in salvage and scrap operations. Aside from the pure commercial angle the scrap industry can become and is in many cases a highly technical proposition. A case in point is a company generating many different kinds of scrap whose original practice was to accumulate all scrap, other than that which was coated, galvanized or painted, in one large pile directly behind the building. The scrap was piled under an overhead crane and it was their original practice to load the scrap into gondolas once a week. This scrap was sold as

**U**SE of an industrial lift truck permits loading of a freight car with 50 tons of these electric furnace bundles in approximately an hour.





balancing stock to a dealer for further preparation prior to shipment by him. Smaller lots of scrap, known as maintenance scrap, were also being sold by this steel fabricator to a dealer and this particular scrap was hauled out of the plant by truck.

It was estimated that there was a minimum of 45 tons a week average of production scrap and a couple of tons a week average of maintenance scrap. In studying this problem of scrap disposal, it was estimated that approximately 60 pct of the production scrap could be shipped direct to a consuming mill in carload lots as No. 1 bushelings or No. 2 heavy melting steel without any preparation being required. The remaining 40 pct plus the maintenance scrap, however, required further preparation. It was recommended to this manufacturer that he purchase a small alligator shear which could be installed in the location used to store the production scrap. By shearing the 40 pct of the production scrap requiring further preparation, the entire accumulation of scrap could then be sold direct to a consuming mill as the two grades mentioned previously. It was also pointed out to the manufacturer that the shear man could also shear a large percent of the maintenance scrap and include this material in the cars shipped direct to the consumer.

As manufacturing companies ordinarily frown on spending money to produce better scrap, the whole program was laid out on a dollar and cents basis. It was pointed out to the manufacturer that the production scrap was being sold at a differential of about \$6 a gross ton under the top market price being paid by consumers in the Buffalo area. If the manufacturer adopted the recommendation requiring the use of a shear, it would cost him \$20,000 to \$25,000 to get the equipment. If the shear were to be written off during the period of three years, using 45 gross tons per week as the average tonnage shipped, the cost per ton of the scrap shipped would be 0.356¢ per

gross ton, using \$1.50 as the cost of the shear man or \$60 a week. It would not cost over \$1.33 per gross ton to prepare the scrap, or a total of \$1.686 per gross ton for labor and amortization of the shear.

This was not the only recommendation made. The overhead crane which was being used to pile the scrap on the ground could be used to load the scrap directly into gondola cars. The additional preparation proposed would not cause the spending of additional time in loading and it was thought it would prove to be actually easier to load as the crane operator would not have to contend with the long and sometimes tangled production scrap. The company had a portable conveyer that was not on the scrap site. It was recommended that they spot gondola cars on the siding and the conveyer could be moved to the loading site and placed at the base of the shear to catch the steel as it was sheared. The conveyer would then drop the steel automatically into the car. This method would still require the placing of the prepared material, which did not require shearing, on the conveyer or still using the crane to load this material into cars. Based on these figures and recommendations, the manufacturer was told that this operation would produce a gain in revenue to him on his ferrous scrap of approximately \$194.00 a week. The entire recommended program was adopted. Actually the manufacturer has netted a little over the original dollar and cents estimate given him.

The intelligent marketing of scrap is a complicated operation requiring knowledge which is wide, detailed and up-to-date. More mistakes—and more costly mistakes—are made in the sale of scrap than in the handling of it. It is obvious that important decisions on segregation should not even be made and cannot properly be made unless they are based on a knowledge of markets. Only by producing scrap of recognized classifications can a manufacturer obtain a price in line with accepted markets.

### ... NEW BOOKS ...

*"Aluminum Alloy Castings,"* by F. A. Lewis. Booklet covers the production and application of aluminum alloy sand and permanent-mold castings and gives information on a number of wartime advances in the aluminum casting art. Methods of heat treating, trimming and cleaning, and machining and finishing are described. The material was obtained in a postwar survey sponsored by the Aluminum Assn.'s foundry division. Aluminum Assn., 420 Lexington Ave., New York 17. 50¢. 64 p.

\* \* \*

*"Industrial Hygiene and Toxicology, Vol. I."* F. A. Patty, editor and principal contributor. Book reviews the concepts and practice involved in anticipating potentially dangerous industrial situations and applying preventive control measures. Chapters deal with sampling and analysis of atmospheric contaminants, respira-

tory protection, dermatosis, fire and explosion hazards from dusts and vapors, and other subjects. Interscience Publishers, 215 Fourth Ave., New York. \$10.00. 531 p.

\* \* \*

*"Fundamentals of Light and Lighting,"* by Walter Sturrock and K. A. Staley. Book provides basic information on the nature of light, its measurement, methods of control, characteristics of the materials used in lighting equipment and the principles of illumination design. General Electric Co., Lamp Dept., Nela Park, Cleveland 12. \$1.00. 86 p.

\* \* \*

*"The Story of Magnesium,"* by W. H. Gross. First in a series of general technical books on metals to be published by the American Society for Metals gives information on the production and uses of magnesium. The text is designed for understanding by those without professional or technical training. American Soc. for Metals, 7301 Euclid Ave., Cleveland. \$1.50. 272 p.



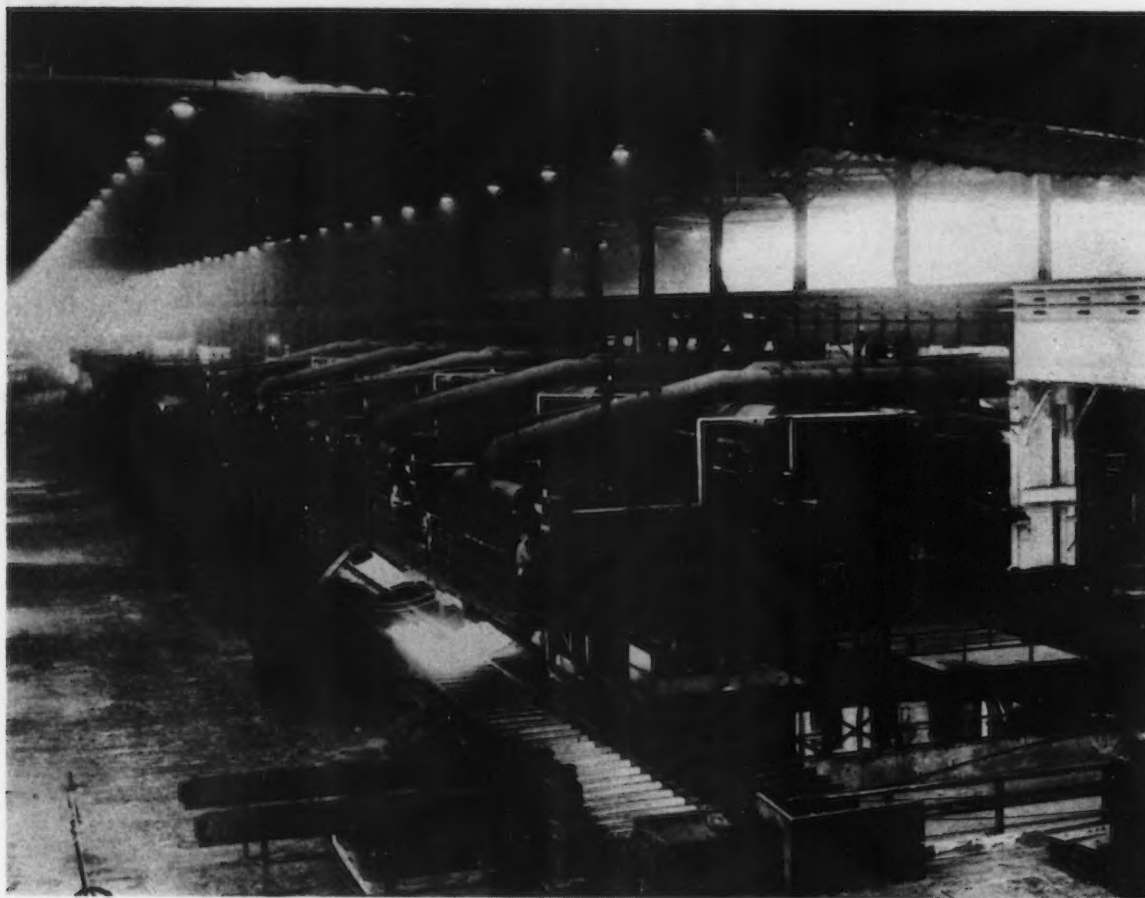
# Gary Sheet and Tin Mill

## Modernization Completed

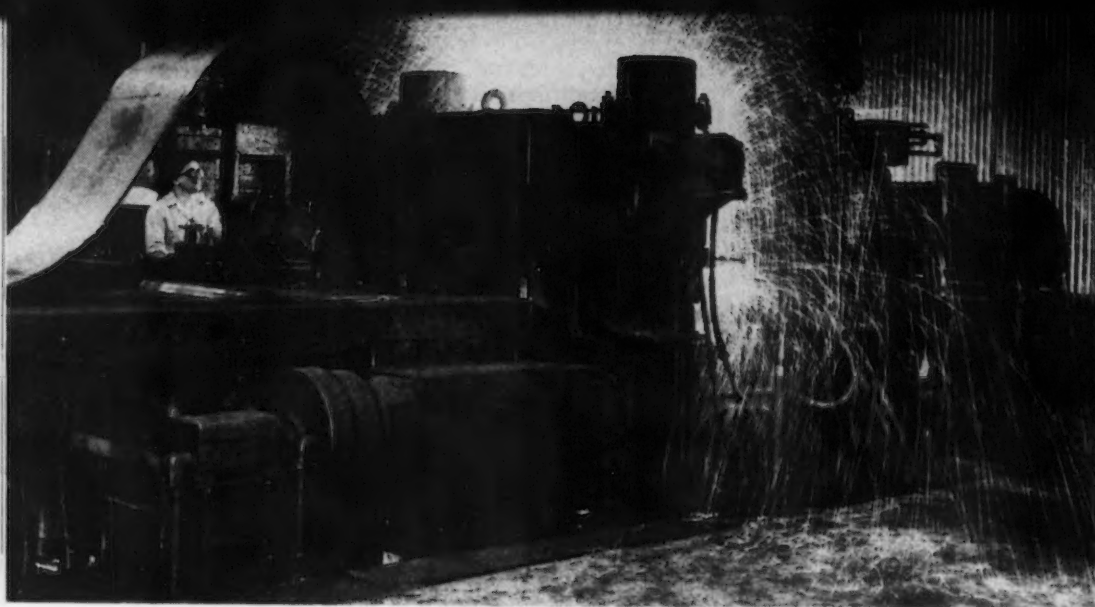
**E**XTENSIVE additions and alterations of existing facilities of the Gary sheet and tin mill of Carnegie-Illinois Steel Corp. have recently been completed. Better yields, higher operating speeds and better handling, resulting from the modernization program, have increased the mill's capacity to produce cold-rolled sheet and tin plate.

Major installations of new equipment were for production of sheets, and comprised a 54-in., four-stand, cold-reduction mill; a 60-in., high-speed temper mill; a 54-in. electrolytic cleaning

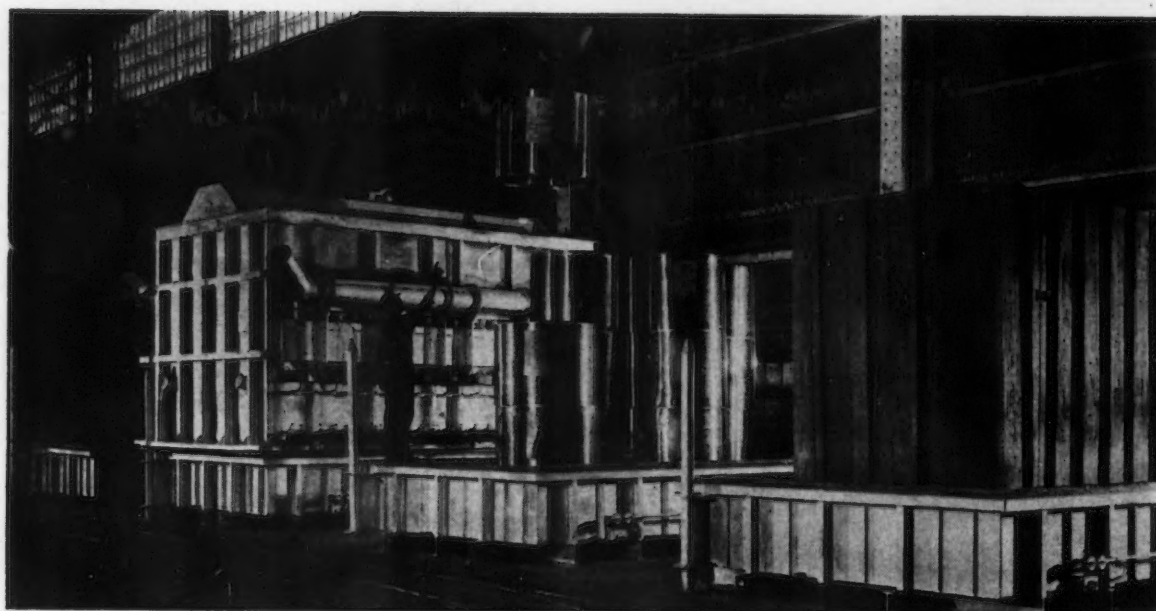
line; a 54-in., side trimming and slitting line; a 54-in. shear line for cold-reduced and another for hot-rolled products; 16 coil-annealing furnaces with 56 bases; and two 76-in. scrubbing and drying lines. Various changes and additions were made to the 80-in. continuous hot mill and 84-in., three-stand, tandem cold-reduction mill to increase their capacities. New additions to continuous coating facilities include a galvanizing line and a terne coating line. The accompanying illustrations show some of the improvements.



**F**IG. 1—The line of five slab-heating furnaces now in operation at the 80-in. continuous hot mill of the Gary sheet and tin mill of Carnegie-Illinois Steel Corp. Two are new units and three older ones have been modernized.



**FIG. 2** — Flash welder installed on a continuous pickling line in the tin mill. Welders installed on the No. 8 and 10 lines permit welding of hot-rolled coils from the 80-in. continuous hot mill into 24,000 to 30,000 lb coils. Speeds of the two five-stand tandem cold-reduction mills were increased from 1700 to 4600 fpm.



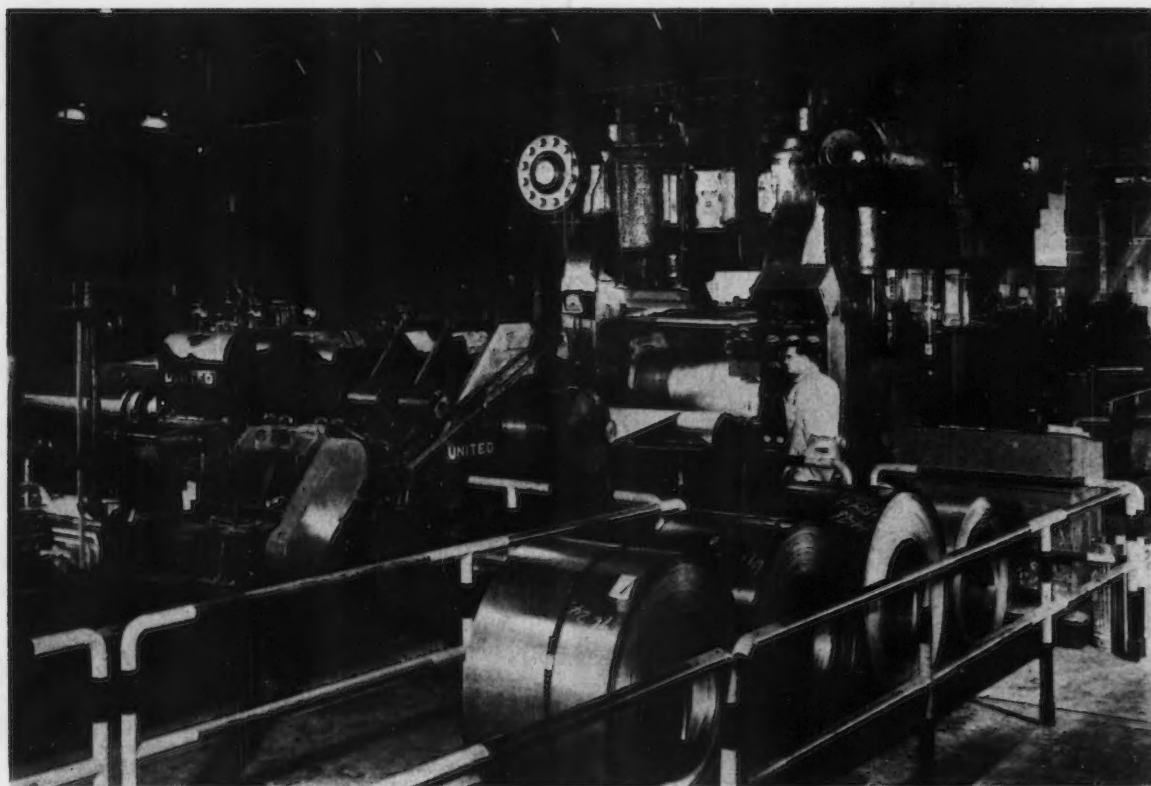
**FIG. 3**—View of part of the new annealing equipment for tin mill products installed in the Gary mill. Height of 44 existing furnaces was increased and 135 existing bases were altered to provide for the larger coils.



**FIG. 4** — Part of the new shearing equipment now in operation in the tin mill. Large coils are handled at shearing speeds up to 1000 fpm.



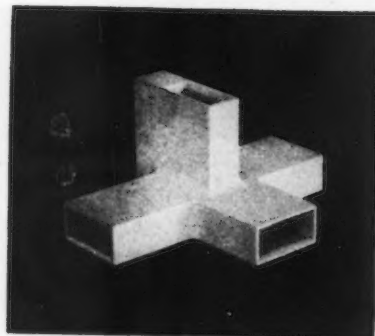
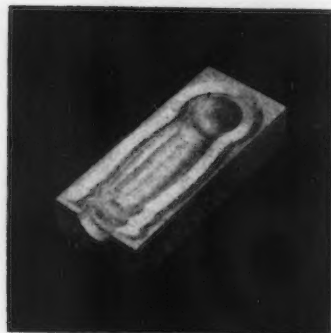
**FIG. 5**—The new 54-in., four-stand, tandem cold-reduction mill which operates at speeds up to 3000 fpm. The uncoiler and recoiler were replaced on the existing three-stand tandem mill and its speed was also increased. A scale and up-ender was also installed on the latter mill.



**FIG. 6**—Temper mill in the Gary sheet mill. Temper rolling facilities were increased and speeded up in the modernization program.



# Precision Casting with



**SOME** typical castings produced with frozen mercury patterns.

Castings weighing up to 60 lb, with tolerances of  $\pm 0.0015$  in. per in., are now being produced by a process which makes use of frozen mercury for the pattern and a fired ceramic shell-like material for the mold. The general details of this technique are described by the author.

By WM. I. NEIMEYER

*President,  
National Bronze & Aluminum Co.,  
Cleveland*

**P**RODUCTION of ferrous and nonferrous castings weighing up to 60 lb, with tolerances of  $\pm 0.0015$  in. per in., and castings with no draft, are possible with the development of a precision casting process utilizing frozen mercury for the pattern. This process, used to produce "Perfecast" castings, is extremely versatile and makes possible the production of castings heretofore considered impractical.

Very intricate designs, undercuts, threaded holes, internal contours and fine surfaces are obtainable by this process, in addition to sound castings of all castable alloys.

The process consists of making a die into which mercury is poured and frozen. The frozen mercury pattern is then removed from the die and coated with a ceramic, after which the mercury is melted out and the ceramic mold fired. This ceramic mold is a complete reproduction to size into which molten metal at temperatures up to 3300°F is poured.

After removing the ceramic by a light sand-blasting operation and cutting off the gates and risers, a finished casting to size is obtained. Alloys of aluminum, brass, bronze, steel, stainless

<sup>1</sup> Trade name of castings produced by National Bronze & Aluminum Co. by the Mercast process under license from the Mercast Corp., New York. The process was invented by E. F. Kohl, Lakewood, O.



# Frozen Mercury Patterns

## *... the Mercast Process*

steel, heat resisting alloys, etc., have been successfully cast in pieces weighing a few ounces to 60 lb. To date, no limit has been set for maximum size castings other than furnace capacity and auxiliary handling equipment.

Dies used in the process can be designed similarly to those used in the other precision casting processes with the exception of the die material. The die material must be capable of withstanding amalgamation or attack by the mercury, such as steel, aluminum and certain non-metallics. Dies made of many of the low temperature alloys must first be plated. They can be cast, molded or machined, but it must be kept in mind that the finished product is no better than the die and any imperfections or error would be reproduced or exaggerated in the final casting.

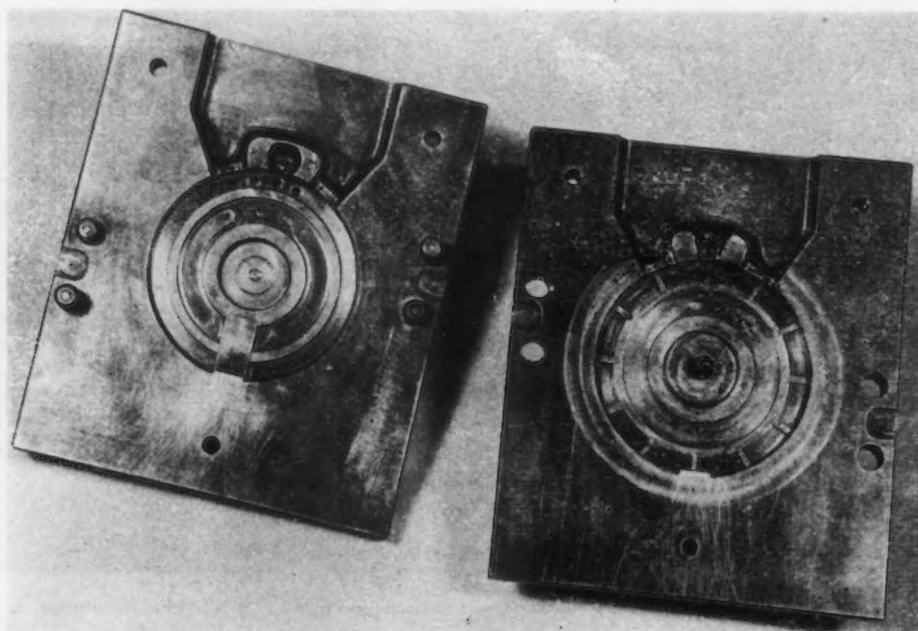
However, dies can be designed so that they can be constructed of assembled sections which reduces their cost. Internal threads or cores

can be used which are so designed that they can be withdrawn or turned out as a threaded bolt. If the design of the casting is such that the internal cores cannot be withdrawn, the mercury patterns are made in sections and assembled before investing in ceramic.

A unique feature of frozen mercury is its cohesive force or cohesiveness, sometimes referred to as coalescence. Two pieces of frozen mercury brought in contact are instantaneously bonded and become one. This piece then cannot be taken apart without destroying it. This, obviously, permits the assembly of many varied forms into one unit, which could not be made in any other way.

Shrinkage allowances are made for the metal similar to all other casting methods. Since the mercury is frozen progressively, no shrinkage allowances are required for the solidification of the mercury pattern. However, the design of the gates and risers is very important, not only

FIG. 1—A typical die used with the Perfecast casting process.



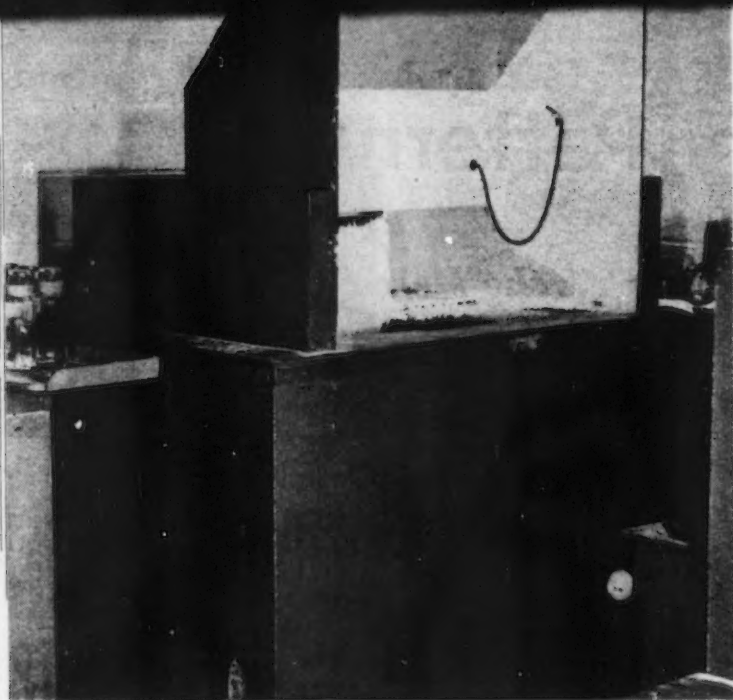


FIG. 2—Freezing chamber used to solidify the mercury pattern in the die.

from the casting viewpoint, but also to obtain proper solidification of the mercury pattern in the dies.

It must be borne in mind that mercury freezes at about  $-40^{\circ}\text{F}$  and all this freezing must be

performed in boxes well below this temperature. The temperatures are obtained with dry ice or mechanical refrigeration.

The dies are assembled and partly immersed in the cold bath. A lubricant is poured into the die and then liquid mercury is poured into the cavity displacing the lubricant. Freezing, leaving only a molecular film on the die surface, is from the bottom up. When freezing is almost completed, a rod is inserted into the riser and the frozen pattern is removed from the die. This rod is used to handle the pattern.

At this time, additional gates or risers can be added by bringing them in contact with the pattern which welds them. Also, any bunching or grouping of castings for a single mold can be made.

These mercury patterns are then invested in ceramic by dipping them in a ceramic slurry which is kept at a temperature well below the freezing point of mercury. A number of coats are put on, depending on the individual casting, and before each successive dipping the previous coat is permitted to dry. The ceramic is usually built up to about  $\frac{1}{8}$  in. and the mercury is melted out. The removal of the mercury is a flushing operation where warm mercury is sprayed onto the cold mercury, thereby obtaining controlled melting.

The ceramic molds are then put through a firing operation at a high temperature, for a period varying up to 1 hr. The resultant ceramic shell has a fine cavity surface similar to china and it rings when tapped. It is also very

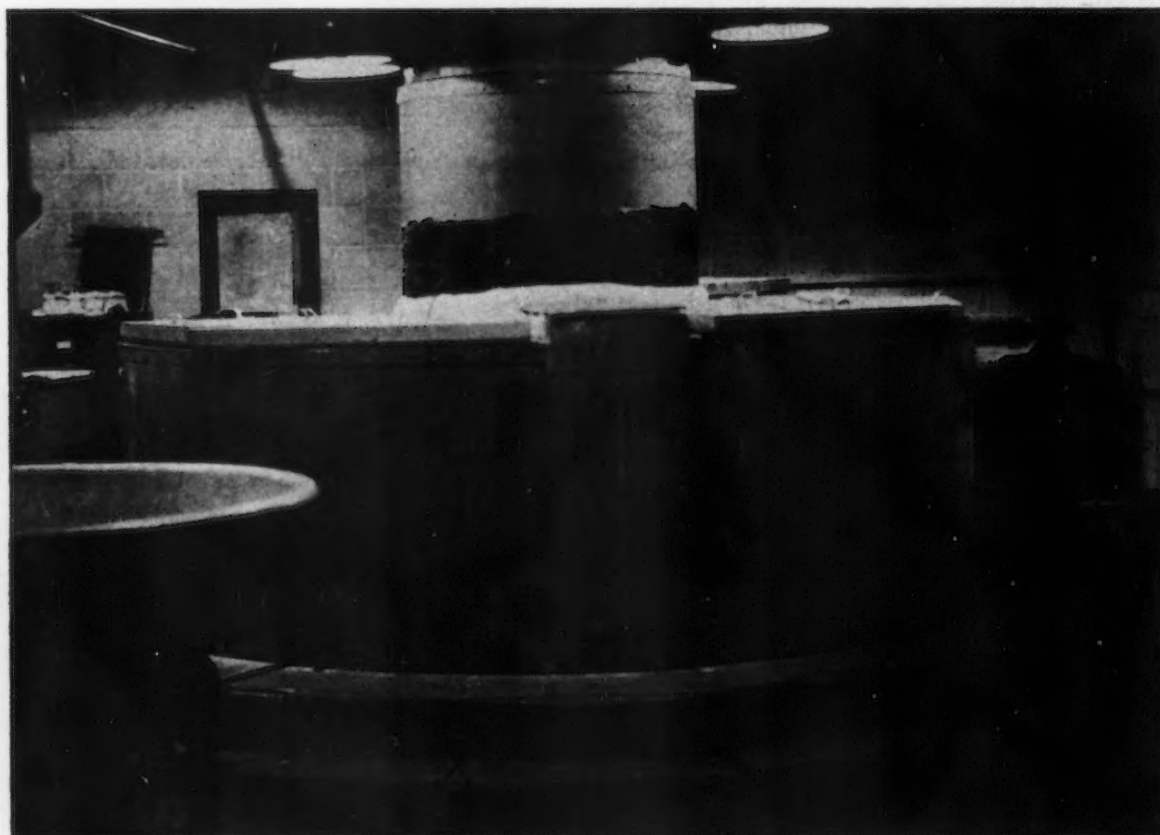


FIG. 3—Cold chamber for storing the frozen patterns prior to dipping. The investment is also stored here, and dipping operations are carried on in this unit.



permeable, tests indicate, in fact more so than sand of comparable grain size.

The ceramic is then inserted in a flask and surrounded with dry sand for a backing material, is pre-heated to desired temperature and cast. Tests have shown that the ceramic can withstand 3000° F without noticeable signs of deterioration, and can resist the thermal shock of the hot metal being poured into a cold mold.

Although the process is similar to other precision casting processes, a number of advantages are apparent. The frozen mercury pattern is very stable and does not change size or distort. Internal cores, threads and contours, can be obtained by withdrawable cores or welding sections together. This makes it possible to obtain some castings not commercially feasible by other means.

The ceramic used can be pre-heated to any required temperature, which means that very thin sections can be obtained by gravity casting as well as by centrifugal means. The process is adaptable to either.

However, the permeability of the ceramic lends toward much sounder castings, and coupled with its refractory properties, permits casting of alloys once believed very difficult or impossible to cast.

Furthermore, since a thin shell is used, greater control of metal structure is obtained by the rate of cooling after casting. It is possible to cool the castings at a much faster rate by using either high-conductivity material, instead of sand for

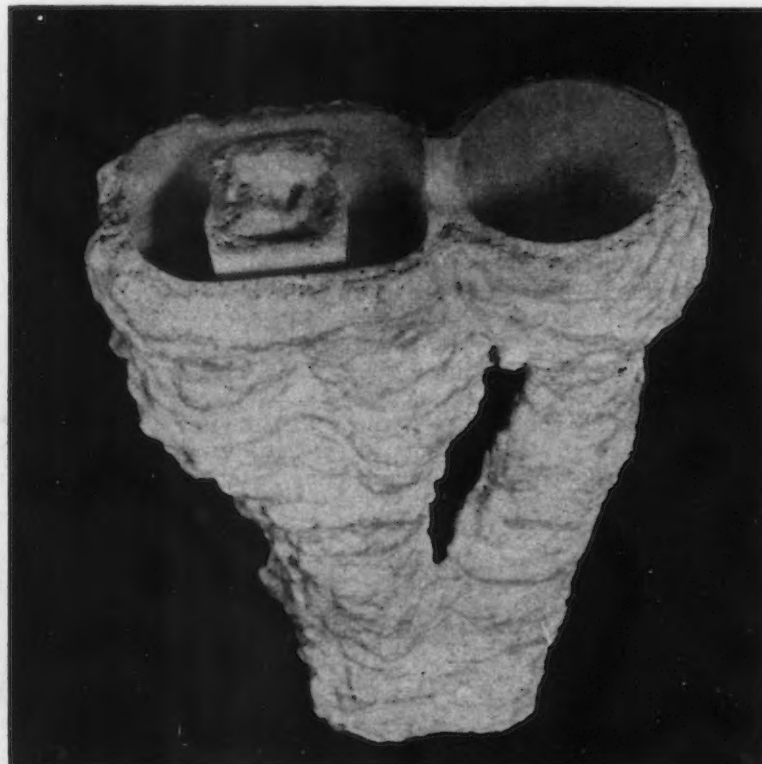


**FIG. 4**—Flushing the mercury pattern from the ceramic shell. Warm mercury is used for this flushing operation.

a backing, or by chilling the casting by immersing in an oil, water or air blast.

Tests have shown that some alloys are comparable to wrought materials in strength and ductility. This process permits non-machinable alloys to be cast to size as well as practically eliminating subsequent machining operations on those alloys that can be readily machined.

• • •  
**FIG. 5**—A ceramic shell after drying and firing. This shell is placed in a container and surrounded with a backing material for the pouring operation.  
• • •



# Drilling Square Holes on Lathe

By JOSEPH ALBIN  
New York

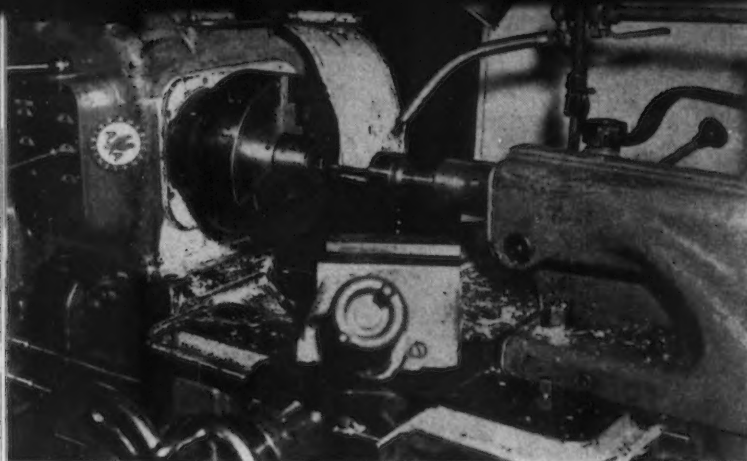


FIG. 1—Setup for drilling a square hole with a lathe. The full floating chuck with triangular drill is shown at right. The work is within the holder, behind the guide plate.

ALTHOUGH drilling multi-sided holes on a lathe using a full floating chuck cannot compete with broaching for accuracy of dimension, American Airlines at its Tulsa maintenance depot finds the method economical on small lot production. Easy interchangeability of drills and guide plates enables the drilling of triangular, pentagonal, hexagonal, and octagonal holes as well as to square holes. Airline machinists extend the capacity of the tool. For example, if it is desired to drill a 12 point hole, a square hole is first drilled and then the work is put in a milling machine with a slotting attachment to finish the 12 point hole.

American Airlines uses the full floating chucks and drills manufactured by Watts Bros. Tool Works, Wilmerding, Pa. Fig. 1 shows the positioning on the lathe of the drill, the floating chuck, and the guide plate retained in holder which also serves as work holder. Assuming that a square hole is to be drilled in a given piece of round stock, the procedure is first to drill a round hole having a diameter equal to the inscribed circle. To finish off with the square hole, a triangular drill is used. To drill any polygonal hole, the rule is to use a drill having a number of faces one less than the number of sides in the hole. The hole as finally drilled will have the profile of the guide plate.

Unlike the action of the two cutting edges of the conventional drill, it is the downward face of the Watt's drill which chips away the metal. The drill and the full floating chuck may be regarded as a free floating cam follower while the guide plate serves as the cam. As the work holder with guide plate are revolved in the lathe, the guide plate steadily presents to the cutting edges of the drill more and more projecting metal

to be notched away, thus forming the corners of the polygon. The floating chuck allows the drill as the follower to change position according to progress of metal removal.

After the hole is drilled to the required depth, drill and work holder are removed and the work is exposed to the cut-off tool. Several blanks with the desired type of hole can be made from a given length of stock by drilling the round hole, drilling multi-sided hole to a depth permitted by length of drill, and cutting off the bar to desired lengths.

In fig. 2 is shown the Watt tool, assembled and disassembled, respectively. The drill is retained by a recessed set screw in the chuck; and the guide plate is positioned in the work holder by two pins and retained by two holding screws. In the side of the holder is a set screw for retaining the stock. Just these parts are required to bring the drill into operation; no other adjustment components are provided.

The speed ring cowl lock with hexagonal hole, made from SAE 4130 steel, is an example of a part produced economically in lots of 800 pieces by the Manufacturing dept. of American Airlines. The guide plate and the drill of five cutting edges used to make the hexagonal hole in the speed lock are shown alongside. Another frequent use of the tool by the company is in connection with repair of hand tools, exemplified by the torque wrench in fig. 2. The round piece with square hole made from SAE 4130 steel will be welded to the shank of a wrench. The 12 point hole in the wrench as shown was commenced as a square hole and finished in a milling machine. The guide plate and triangular drill which made the square hole are at the right.

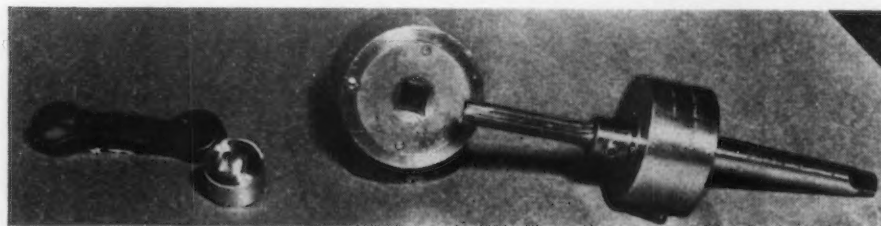


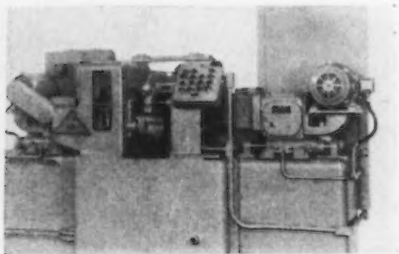
FIG. 2 — The assembled chuck and drill, guide plate and work holder, and drilled part made with tool are shown here.



# New Production Ideas . . .

**A special tapping machine, a sheet metal drawing press, rack washers, centrifugal blowers, a nailing machine, a ductility tester, a portable melting furnace, stainless-clad steel, and small tools and attachments such as a tracer for shaft and profile contouring, a radial relief grinding accessory, core drills, and reversible plug gages are discussed in this issue.**

**A** SPECIAL two way eight-spindle horizontal lead screw tapping machine taps four split sleeves at each cycle with automatic unloading of parts. The machine is designed for tapping an automotive adjusting sleeve for a steering connecting rod and consists of: A fabricated center base supporting a three station trunnion; and two cast iron end bases each supporting a lead screw tapping unit with a



four-spindle tapping head. On each of three trunnion stations, a double holding fixture is mounted, each holding two split sleeves. In loading, parts are placed in position and a sliding guide keeps the parts in place until they reach the second station where they are hydraulically clamped, tapped and unclamped. At the third station they drop into a finished part chute. Four parts are tapped in each end at each cycle. The machine cycle is automatic after parts are loaded and cycle button is pressed. Production is approximately 480 pieces per hour at 100 pct efficiency allowing 28 sec for loading. *Le Maire Tool & Mfg. Co. For more information, check No. 1 on the attached postcard.*

## Core Drill

**L**ONGER life and better hole finish are claimed for an improved core drill that has wear strips of wear-resistant metal brazed on the entire length of the flutes. These wear strips are said

to eliminate the abrasive wear from cast iron chips on the body of the drill behind the carbide and eliminate loading conditions that score the finished hole. *Super Tool Co. For more information, check No. 2 on the attached postcard.*

## Sheet Metal Drawing Press

**T**HE Fastraverse sheet metal drawing press of 1000/500 ton pressure capacity is designed to handle deep draw jobs of large dimensions. It has a platen of 120x72x70 in. daylight opening and 36 in. ram travel. It is equipped with a 300-ton hydraulic die cushion with a platen of 48x52 in. and a 24-in. stroke. The bolster

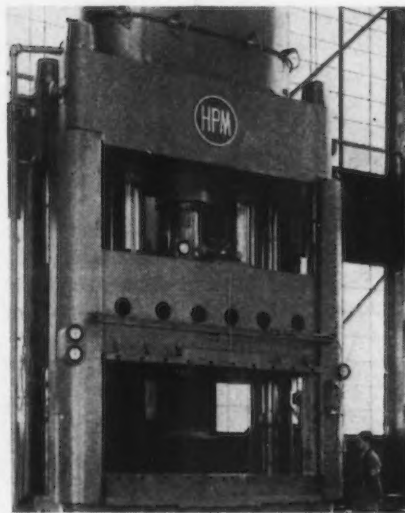
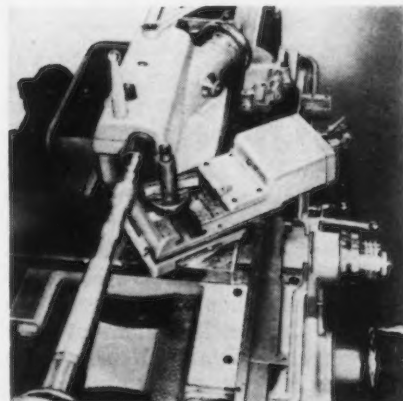


plate is removable. The press is equipped with three main rams for the multiple press ram system of operation in two ranges of pressing speed. A closed circuit Fastraverse system operation regulates the speed and direction of every press ram movement through control of the output of the pressure generating radial pump. The cycle of operation is automatic and controlled by

electric pushbuttons. *Hydraulic Press Mfg. Co. For more information, check No. 3 on the attached postcard.*

## Hydraulic Tracer

**A** HYDRAULIC attachment for shaft and profile contouring that can be installed without drilling or fitting on LeBlond heavy duty lathes accommodates stock to the full swing capacity of the lathe, and does not interfere with cross slide travel or prevent the use of the taper attachment. Available in six sizes, the Hydra-Trace is mounted on a special compound rest that is interchangeable with the regular compound rest in a matter of minutes. It can be used for between-centers duplicating and for profile facing, the shift from one to the other being made easily and quickly. Operating on the template-actuated stylus principle, the Hydra-Trace performs the complete range of lathe operations. A stylus control metering device is built into the compound rest and diameters are adjustable by the lathe cross feed screw. The attachment consists of a tracer slide, template, template carrier, bed bracket, and hydraulic tank and pump. Template holder and all controls are located in front of the





lathe. Templates are flat and can be made in any tool room. *R. K. LeBlond Machine Tool Co. For more information, check No. 4 on the attached postcard.*

#### Cutter and Tool Grinder

**T**HE new Model 10 universal cutter and tool grinder is a cabinet base machine of medium capacity. A hand wheel at the top of the machine raises and lowers the column and head. The longitudinal movement may be controlled by either a hand wheel or a lever on the front of the machine or by a lever in the rear. Cross movement of the saddle is controlled from practically any desired position by a hand wheel on the front or rear of the machine. Dials, graduated in thousandths, are provided for vertical and transverse movements. The head swivels through 180° and can be locked at

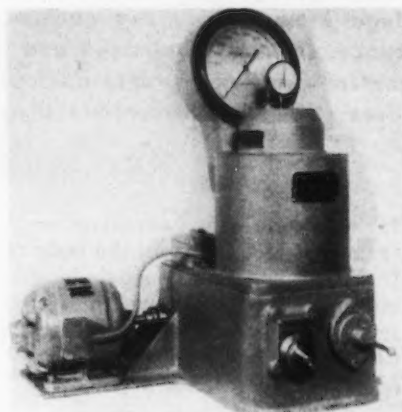


any desired setting. The table swivels to 90° either side of center to provide any desired relation between the table and the grinding wheel spindle. The spindle is driven through a V belt by a ½ hp motor mounted on the head. Two spindle speeds are provided. The table is 5 x 30 in.; longitudinal table movement is 16 in.; cross movement of the wheel is 8 in. and vertical movement of spindle is 8 in. *Gallmeyer & Livingston Co. For more information, check No. 5 on the attached postcard.*

#### Ductility Testing Machine

**D**RAWING qualities of sheet metal can be tested with a new bench model ductility testing machine that has a fast cycle. Speed of the piston travel is adjustable within a wide range by a simple dial setting and complete tests are possible in 15 sec. The machine is built with a capacity of

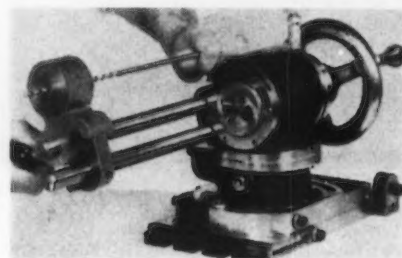
15,000 lb to cup test material up to ⅛ in. thick or 30,000 lb for material up to ¼ in. thick. The model is motorized and hydraulically operated. An 8½ in. diam pressure



gage, protected against overloading, incorporates a maximum indicating dial to show pressure at which yield in the specimen occurs. A depth indicator shows depth of draw at any moment by direct reading. The machine measures 2 ft 11 in. high x 26 in. wide. *Steel City Testing Machines, Inc. For more information, check No. 6 on the attached postcard.*

#### Grinding Attachment

**R**ADIAL relief grinding of long tools not equipped with centers is possible with a new accessory for the D-S grinding fixture. The device mounts on the bars of the fixture and holds the tool close to the end for grinding support. A clamp gives extra rigidity to the unit. The accessory swivels on the top bar so that tools with large shanks can be inserted from the back. There is no need of moving



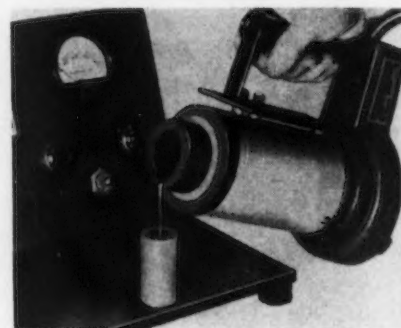
the fixture from set position when the same form is being ground on more than one tool. Standard drill bushings and liners can be inserted for any size tool up to 1⅜ in. diam. *Royal Oak Tool & Machine Co. For more information, check No. 7 on the attached postcard.*

#### Hydraulic Dynamometer

**F**OR load-testing motors, hydraulic dynamometers have been designed that make idle, pull-in, pull-up, full-load and locked tests. The locked test can be made without shutting off the motor to insert a locking pin or similar device. All tests require little effort on the part of the operator. The dynamometer is foot-controlled, leaving the operator's hands free. Exact torque in ft-lb can be read directly from the gage furnished with the instrument. Dynamometers come fully assembled on a steel top approximately 36 in. square. *Wagner Electric Corp. For more information, check No. 8 on the attached postcard.*

#### Portable Electric Furnace

**T**HE Handy-Melt portable electric furnace provides controlled electrical melting of nonferrous metals. The furnace weighs 5 lb

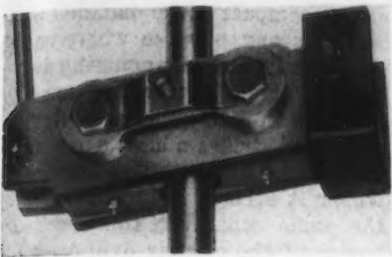


and permits the user to melt up to 2 lb of metal. A pyrometer indicates metal temperatures and a double throw switch permits setting to prevent overheating of the metal. A graphite crucible provides a reducing atmosphere and eliminates dangerous oxidation of metal during melting. The entire furnace is lifted for pouring. It operates on 110 v ac or dc. *Jelrus Co., Inc. For more information, check No. 9 on the attached postcard.*

#### Drop Hammer Rod Clamp

**T**HE Ceco-Drop, a new gravity drop hammer, raises the ram and die by a piston and rod operating in a steam or air cylinder. At the top of the stroke the air or steam is exhausted and the ram and die drop by gravity. Holding the ram at the top of its stroke is accomplished by a clamp made up of two steel blocks supported in a suitable frame. The clamp is held

in horizontally by an air valve when the rod is moving up or down. To hold the ram at the top of the stroke or at any point on the down



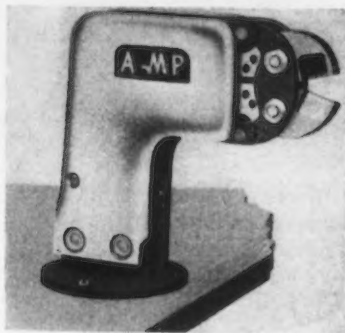
stroke, the clamp drops and the clamping blocks grip the rod, halting all movement. The rod may be released by lifting the clamp to the horizontal position. *Chambersburg Engineering Co.* For more information, check No. 10 on the attached postcard.

#### Synthetic Cleaner

FOR removing mineral oil type soils, a synergized synthetic cleaner, Quaker Formula 100, can be used at concentrations of 2 to 3 oz per gal of water as a tank type cleaner in the temperature range of 180°F to boiling. It will prepare metal surfaces for bonderizing, electroplating, painting and other operations with immersion times of less than 2 min in the cleaning cycle. Steel, brass, and aluminum can be cleaned. *Quaker Chemical Products Corp.* For more information, check No. 11 on the attached postcard.

#### Bench Press

A FOOT - OPERATED bench press with cutting head, trade-named Ampli-Versal, is said to do a clean cutting job on wire,

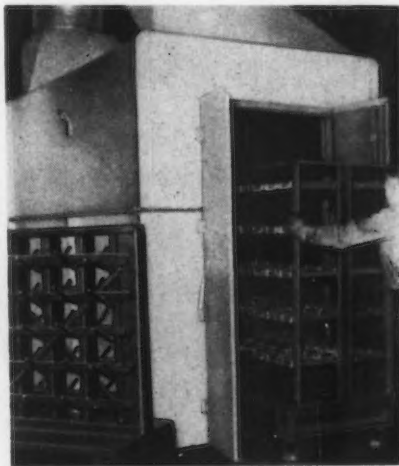


rod, or sheet metal and is so designed that the cutting head can be removed and any of seven other special heads inserted. The other heads perform such operations as indenting, knock-outs, nibbling, U-ing, notching, and installing AMP solderless terminals. Ampli-Versal

comes equipped with the cutting head and is boxed complete with foot pedal, adjustable pedal rod, etc., ready to set up. *Aircraft-Marine Products, Inc.* For more information, check No. 12 on the attached postcard.

#### Rack Washer

CASTER - mounted racks used for handling small parts in industrial plants can be cleaned at the rate of 100 racks per day with an automatic rack washer set on a 3-min wash cycle. The washer is completely enclosed and is a pit-type installation for easy access at floor level. No permanent operator is required, but instead each trucker can be responsible for placing a soiled rack in the washer when a clean one is removed. The trucker closes the rack washer, presses a button to start the wash

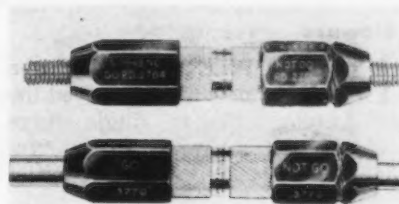


cycle and the washer proceeds to clean the rack and shut itself off. The high pressure oscillating wash mechanism strips away stubborn grease and dirt, including cutting oil, metal chips and grinding dust. *Alvey-Ferguson Co.* For more information, check No. 13 on the attached postcard.

#### Reversible Plug Gages

REDUCED gaging costs and longer wear life are claimed for a new line of plug gages that have reversible gaging members. When a member has worn below size, it can be replaced easily and quickly with the other end. Reversible plug gages are furnished as cylindrical or thread plugs. Cylindrical members are made to AGD standard in sizes from 0.030 to 0.510 in. in steel and carbide and are also chrome-plated if desired. Thread gage members are fur-

nished to X tolerance for checking NC and MF threads in sizes from 0 to 1/2 in. All cylindrical and thread members are hardened,



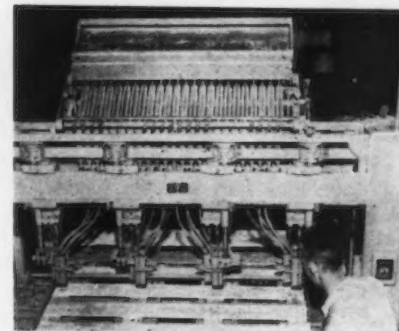
ground and precision lapped to close tolerances. *Pratt & Whitney, Div. Niles-Bement-Pond Co.* For more information, check No. 14 on the attached postcard.

#### Leak-Proof Electrode Holders

NEW leak-proof, water-cooled resistance welding electrode holders use standard size O-rings in place of ordinary packing to eliminate water dripping that causes rust or discoloration of the material being processed. Copper alloy, brass or stainless steel are used for the complete assembly, including all internal parts of the KO holders. This insures full water flow for the life of the unit and keeps the tip ejector mechanism free from rust or corrosion that might interfere with its action. *P. R. Mallory & Co., Inc.* For more information, check No. 15 on the attached postcard.

#### Nailing Machine

LARGE wooden assemblies such as pallets and shipping crates can be made with a commercial nailing machine that operates at



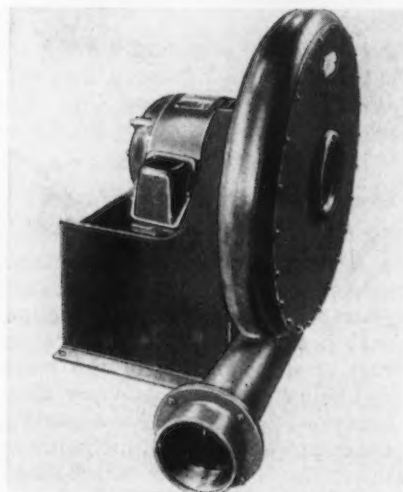
120 strokes per min driving up to 24 nails in practically any nailing pattern. This flat nailing and clinching machine is built in various widths up to 72 in. to fit the particular job. Using 3 to 10 penny nails, the machine includes an adjustable nail feed as standard equipment. Change-over from one operation to another takes approxi-



mately 10 min. *Food Machinery & Chemical Corp. For more information, check No. 16 on the attached postcard.*

### Blowers

**D**EVELOPMENT of a completely new and improved line of Lindberg-Fisher single stage, centrifugal blowers feature full 360° positioning of the air outlet.



Installation or adjustment is simple and quick, and necessity for pipe cutting, welding and extra piping are eliminated. Belt-driven blowers in this line utilize approximately one-half the floor space that is normally required by other conventional type belt driven blowers. *Lindberg Engineering Co. For more information, check No. 17 on the attached postcard.*

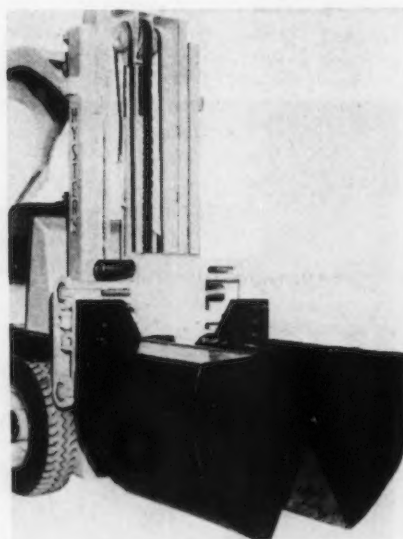
### Hydraulic Vise

**S**IMPLE, two pedal foot control of a new oil-hydraulic machinist's vise leaves both hands free to handle and position work between the jaws of the vise. A power pedal provides a slow short movement of the front jaw and only eight strokes are needed for closing from full open position. Opening and closing of the vise can be controlled at any point by the operator. When jaws have been closed, maximum pressure for gripping and holding can be developed with two additional strokes of the power pedal, providing a pressure of 6000 psi. The jaw is stopped at any desired position by removing pressure from the release pedal. For bench production work involving hand tool operations or assembly, an adjustable production stop can be set at any point within the full range of jaw opening to hold a series of pieces

of the same size and shape. The vise is swivel-type and has 3½ in. jaw width and 6-in. jaw opening. *Columbian Vise & Mfg. Co. For more information, check No. 18 on the attached postcard.*

### Clamshell Bucket for Lift Truck

**A** CLAMSHELL bucket of 7/16 cu yd capacity is available for the Hyster 4000 lb capacity lift truck. The unit mounts on the sliding supports of the basic Load Grab as optional equipment. Operated by a lever at the driver's right, the clamshell opens and closes by means of the same hydraulic power that spreads and contracts the arms of the standard Load Grab. A standard lifting height of 8¼ ft,



to the bottom of the closed bucket, makes it usable for loading and unloading trucks and railroad cars. *Hyster Co. For more information, check No. 19 on the attached postcard.*

### Roll-Over Attachment

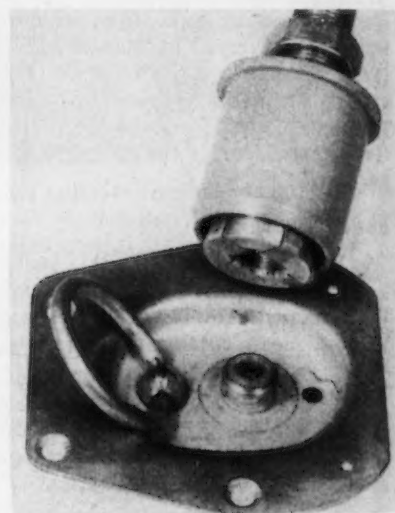
**A** NEW Roto-Lift assembly for the 2 and 3-ton Yak and Yank fork trucks provides 180° rotation of forks in either right or left hand direction, and is powered from the hydraulic pressure system of the fork truck through flexible pressure lines and electric limit switches. Rotation of the fork carriage is accomplished by a double acting hydraulic cylinder and ram assembly with spur gear drive to the ball bearing mounted turntable on which the carriage revolves. Control of rotation is by a handle on the dash. *Mercury Mfg. Co. For more information, check No. 20 on the attached postcard.*

### Power Hammer Adapter

**A**N ADAPTER, the Hamer-Drill, chucked in any ¼-in. electric drill, any speed, converts the drill into a compact power hammer suitable for any purpose where rapid, moderately heavy hammering is required. The Hamer-Drill may be operated in drill press or by flexible shaft and strikes a blow per revolution of the driver. The force with which it strikes is built-in and is the same whatever the speed or power of the electric drill or other driver. Its size, 6½x1½ in. and weight, less than 3 lb, make it handy in close quarters and when used overhead. The tool socket is a 9/16 in. hex opening that makes adapting tools for special purposes simple. *Hamer-Drill Co. For more information, check No. 21 on the attached postcard.*

### Structural Fitting

**T**O speed up installation and removal of attachments, accessories and detachable equipment, the Inst-O-Lok structural fitting permits rapid changing in the assembling and disconnection of units. Positive dog-locking action



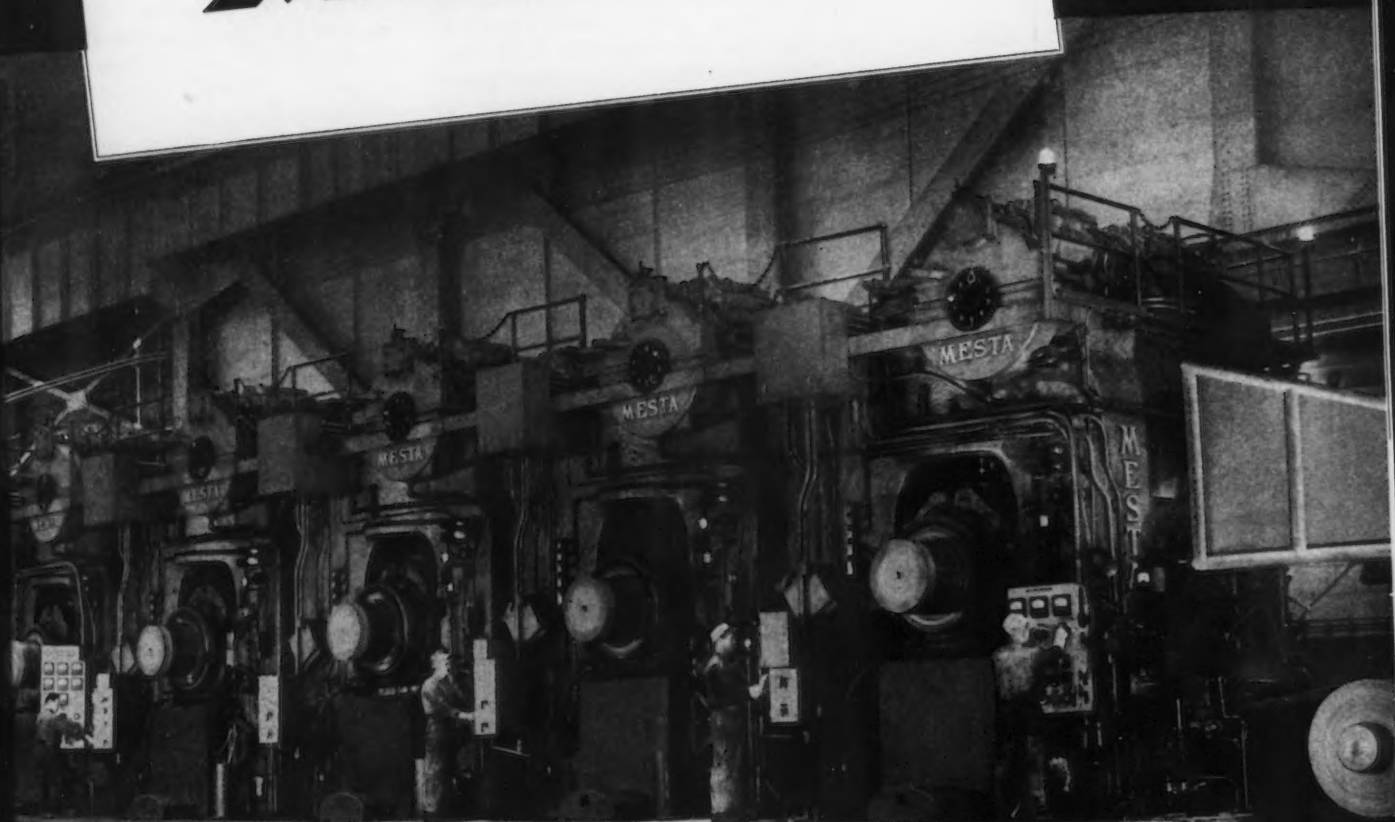
connects couplings to standard tie-down studs, eliminating danger of accidental detachment. The couplings will withstand from 1000 to 20,000 lb tension, depending on size. *E. B. Wiggins Oil Tool Co. For more information, check No. 22 on the attached postcard.*

### Vibration and Noise Detector

**V**IBRATION detection and noise analysis is possible with an electronic amplifier, the Sono-Probe, whose input is vibration or



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**MESTA**



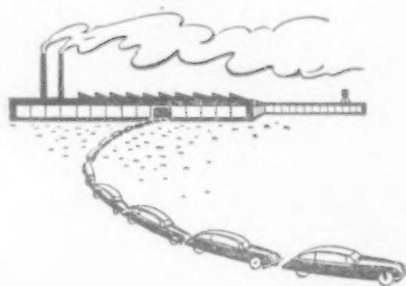
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Four-High, Five-Stand Tandem Cold Mill installed at  
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# Assembly Line

WALTER G. PATTON

- GM and Chrysler researchers produce new roughness gage blocks for machined surfaces . . . Multi-Hydromatic completes largest automatic welding unit . . . Rumors about new light cars should be generously discounted.



**D**ETROIT—General Motors and Chrysler are cooperating in an effort to produce a set of accurately prepared gage blocks for surface finish that may prove to be as reliable and as helpful to the automotive industry as the Johansson blocks are for dimensional measurement.

The new blocks, which have been under development for more than 2 years, are now being produced in quantity for the trade. The specimens of known, uniform roughness will be encased in a metal box ( $4\frac{1}{2} \times 6\frac{3}{8} \times 13/32$ ) in groups of three or four. Twenty seven different roughness values are available in increments from 1 to 1000 microinches.

The standard specimens are accurate reproductions of geometrically ruled gold-plated masters. The included angles of the cutting tool used to produce the specimens varies from  $127$  to  $170^\circ$ ; the peak-to-peak spacing or pitch varies from .004 to .0002 in. with less than 2 pct variation.

It is claimed that accuracy ratings on the new blocks are several times greater than that of any

other existing standard. The ratings have been proved on both the master specimens and the replicas by magnification of the taper sections. According to GM and Chrysler specialists who developed the new standard, average ruling of the specimens at any point is within 5 pct of the rated depth.

With accurate standard finish specimens available to them, it is expected that unskilled operators will now be able to make repeated roughness measurements with consistent accuracy. The specimens will, it is predicted, provide a standard for measurement of the depth of surface irregularities that is accurate within millionths of an inch.

The specimens will be most effectively used to maintain production control of machine processes. The control is effected by comparing a pilot piece (by manual feel or surface exploring instruments) with a standard specimen. Having obtained the desired finish on the part and having established a machining setup to produce this finish, the pilot piece is then used by the inspector or operator as either a visual or tactual comparator for parts subsequently produced.

More than 2 years of intensive research effort and considerable ingenuity lies behind the development of the new surface finish specimens. To make the standard blocks, GM research experts have developed a machine that can rule more than 10,000 lines per inch in the gold-plated master blocks. A triangular-shaped diamond cutter, held at a slight angle to the work, is used to make the surface cuts.

**T**HE process of manufacturing the original and subsequent specimens constitutes an interesting example of research and enterprise. The master specimens are originally plated using a reversed polarity process with about .008 in. of gold. This is polished to about .005 in. thickness. As previously mentioned, the surface is then cut to the desired roughness standard. (Gold was selected because it re-

sists etching and can therefore be cleaned with acid.)

After the master specimen has been cut, the prepared surface of the block is plated again by the Electroforming Div. of U. S. Rubber Co. The plating is then built up further with hard nickel until a satisfactory backing has been provided. Finally, the buildup replica is stripped off.

Using this negative plate as a master, a positive plate is then produced in the same manner. This process is repeated until six generations have been made. All six master specimens are then carefully checked for accuracy. A somewhat surprising result of the tests conducted thus far indicates that there is no measurable loss of accuracy between the original master and the final replica.

To provide a hard finish that is mildly resistant to attack, a flash coating of rhodium is then plated on the specimen after which three or four of the masters are grouped together to be used for subsequent reproduction of standard specimens.

GM research technicians recognize that even with the new standards available there is much that is yet to be learned about surface roughness, waviness and what type of lay are suitable for a given application. They have purposely avoided extravagant claims for the new gages and have specifically called attention to the fact that the new standards are in no way concerned with luster, appearance, wear resistance, hardness, microstructure and other factors which may be controlled in determining finishing specifications for individual applications.

\* \* \*

**W**ITH clouds gathering over the present market for both new and used cars, it is not surprising that rumors are again afloat in Detroit about small cars. The current rumor has it that three six-cylinder cars with wheelbase of less than 110 in. are being developed for the 1950 market. Two independent producers and one



# THE *Continuous* WHEELABRATOR TUMBLAST for your *High Production* cleaning problems

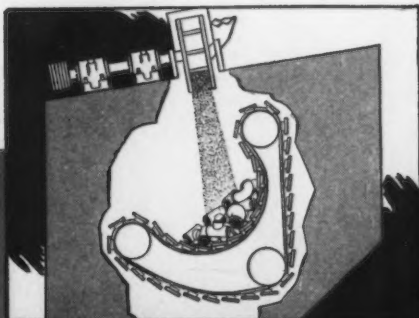
Here is a blast mill that cleans continuously without stopping for loading or unloading. The work is completely exposed as it tumbles and travels progressively under the blast of one or more airless Wheelabrators.

Operating in this manner the machine is ideal for line production . . . it reduces floor space by doing the work of multiple machines . . . it speeds up production . . . and cuts cleaning time, labor and costs.

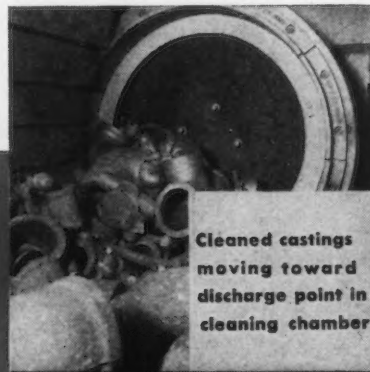
American exhibited the first airless continuous blast mill at the 1940 Foundry Show and now has more than 8 years of manufacturing and operating experience with this type of machine. Repeat sales to users in some of the nation's largest industries testify to its outstanding performance.



Looking toward the loading end of the cleaning chamber.



Endless apron conveyor provides complete exposure of work to the blast.



Cleaned castings moving toward discharge point in cleaning chamber.



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## Correction

*Detroit*

• • • A serious error of omission was made in describing the new Chevrolet process for bonding brake linings to brake shoes. The facts, as stated, are essentially correct. (IRON AGE, Mar. 3, p. 118.) However, it should have been pointed out that Chevrolet applies a 4000 lb shear load to every brake shoe. As mentioned, one shoe in every thousand is tested to destruction under loads ranging from 13,000

to 16,000 lb. In every test conducted thus far, the rupture has occurred in the lining itself rather than at the point of bond.

It has also been pointed out that production studies of the new process were actually under way 10 years ago. The basic research that led to the development goes back even further, it is reported. "Chevrolet is overlooking no opportunities," we are reminded, "to make its new brake shoes 100 pct good."

member of the Big Three are reported to be involved.

Assuming the rumors are true, such reports are apt to lead to the erroneous conclusion that a Detroit "light car" is just around the corner. As nearly as can be determined, one established producer will have a low priced car ready for introduction as a 1950 model. This is Kaiser-Frazer. While other producers are undoubtedly reviewing their light car prospects, definite decisions are still to be made, it is

believed. If any other car builder is getting ready to go into production with a light car this year, there is no evidence that a tooling program has been placed.

There are several reasons why light cars have been studiously avoided by Detroit manufacturers during the postwar period: (1) The public won't buy light cars in large quantities; (2) there is no way to reduce production costs in proportion to the decrease in weight; (3) light cars offer direct

**NEW SURFACE FINISH STANDARDS:** Shown in the illustration is a set of three surface finish standards developed jointly by General Motors and Chrysler research specialists. The specially-prepared specimens have surface irregularities that are accurate in depth to a millionth of an inch. Most effective use of the new surface finish standards will be to maintain production control after finishing standards have been established.



competition to the larger models being sold on used car lots; (4) volume is the key to low production costs and it would be necessary practically to abandon production of some of the present models to reach the required volume; (5) car producers have just finished paying the biggest tooling bill in their history and they are naturally concerned about getting their money back for the present tools.

Production of a light car would also be contrary to another basic policy of the automobile industry. Auto executives have always maintained that the industry faces two kinds of direct competition—competition among the individual producers and competition for the consumer's dollar. The auto industry is pardonably proud of its success in attracting an increasing share of the consumer's dollar. This explains why cars have constantly become larger and more elaborate, even during a period when material shortages were rampant. As long as the industry was convinced that it could continue to sell its products in competition with the products offered by other industries it continued to offer the public bigger and relatively higher priced cars.

When the automobile industry feels it is losing its grip on the consumer's dollar, there will undoubtedly be a rush toward light cars. But no one is expected to be crushed in the rush for quite some time.

\* \* \*

**M**ULTI-HYDROMATIC WELDING & MFG CO., East Detroit, has just completed what is believed to be the largest fully automatic welding machine yet built.

Operating at 100 pct efficiency, the machine will produce 72 roof truss sections per hour for Lustron homes. The welder, which weighs 71,000 lb, has 34 transformers and 68 welding guns. The machine is capable of making 164 welds in 47 sec. It is more than 60 ft long and cost in excess of \$100,000.

In the hydromatic equipment, oil pressure is utilized to actuate the welding guns on a rotation basis. Using the multiple transformer setup, up to four welding guns can be fired from each transformer. Thus, depending upon the amount of power available, any number of transformers can be energized simultaneously to produce an almost unlimited number of welds.

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• Truman program calls for worldwide technical cooperation . . . Global Marshall Plan not intended . . . Private capital emphasized . . . U. S. will work through United Nations.



**W**ASHINGTON — Government officials working on a program designed to carry out "point four" of President Truman's inaugural address will eventually come up with a plan which calls for worldwide technical cooperation on a scale never before deemed possible. If successful, this program could provide a basis for the lasting peace which most of the world strives for, but its concrete accomplishments might not be visible for many years to come.

It will be remembered that the President called for "a bold new program for making the benefits of our scientific advances and industrial progress available for the improvement and growth of underdeveloped areas."

Legislation to carry out the President's suggestion will not be sent to the Congress for several months, according to State Dept. officials working on the project. It is for this reason, perhaps, that considerable misunderstanding has arisen concerning the objectives of this

program and even more important the part the United States government will play.

One thing that is quite clear is that the program will not be a global Marshall Plan. Many nations, particularly several in Latin America, were quite disappointed when they found that this was the case. The President in his inaugural address tried to make this clear by pointing out that the material resources of the United States are limited, but that our technical knowledge is constantly growing and is inexhaustible.

**A**SSISTANT Secretary of State Willard L. Thorp, who heads up an Inter-Agency Committee to develop the program, in a recent speech at Lake Success, emphasized that "the bulk of the effort, the drive, the organization, the plan and much of the financing must come from the people themselves and from their own governments." He further stated that the United States is prepared to work with other countries, through the United Nations and its specialized agencies, in bringing about an expansion of activities in the field of technical cooperation in aid of economic development.

If the program is not to be a global Marshall Plan, the question might well be raised as to what actually is contemplated. In this regard, the general objectives are clear but details are still in the idea stage being worked out by the Inter-Agency Committee under Mr. Thorp's direction.

As to general objectives, there is little in the Truman program that is new to United States industry. For scores of years, American manufacturers have been advancing their production techniques in foreign countries. This has been done by making available patents and modern industrial methods, by investing close to \$10 billion in operating plants abroad and by training individuals in almost every part of the world. It has been done for the very good reason that raising foreign living standards expands the markets for U. S. products.

**T**HE Truman program contemplates a continuation and expansion of all these activities. The new feature of the program, State Dept. officials told THE IRON AGE, is that it envisages "a coordinated and constructive direction for our economic foreign policy based on the proposition that the world is becoming increasingly interdependent." In other words, it results in part from a realization that underdeveloped areas are a drag on the rest of the world and a threat to our freedom wherever they exist. It is also hoped that it will be an answer to the spread of communism throughout the world, for as pointed out by Secretary of State Acheson, its objective is "to make clear in our own country and to all the world the purpose of American life and purpose of the American system."

The direct part the U. S. government is expected to play in the program will include continuation and expansion of many current activities. For example, the work of the Institute of Inter-American Affairs, the work of the Interdepartmental Committee on Scientific and Cultural Cooperation, the work of the Dept. of Agriculture in Latin American countries, the \$6 million technical assistance program of the Economic Cooperation Administration, the trade promotion activities of the Dept. of Commerce and the general efforts of this government to lower trade barriers throughout the world.

**A**S to any new agency of government, the new program is not expected to require more than a small central agency to coordinate the requests for technical assistance. Advisory committees from industry, agriculture, and labor will also be set up. Essentially this program of technical assistance is expected to be a cooperative effort with the United Nations or with individual countries to create an economic climate favorable for investment in projects that look toward development of underdeveloped areas. Creation of such a climate involves many steps and for this reason officials working on the



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program point out that it may be decades before tangible results can be realized.

Secretary of State Dean Acheson illustrated this clearly when discussing the program recently. He declared that "there is an idea that if every country can only have a steel mill, then all is well. There is a failure to understand that it is a long and difficult process to develop the skills which are necessary to operate many of these plants. There is sometimes failure to understand that plants be located where the natural resources exist and not on purely nationalistic bases. There is also in many places a failure to understand that unless the conditions are created by which investors may fairly put their money into that country, then there is a great impediment to development. It is no solution to say, 'Well, the private investors won't do it. Therefore, government must.'"

**C**APITAL sources, according to those working on the program will include private capital from within the area being developed, public expenditures by the government of the area, private capital from other countries, and private

and government capital from the U. S. But before any approach can be made to actual investment in economic projects a great deal of informational work must be completed. Those working on the program are planning a survey to determine the needs of the various underdeveloped countries, as well as the ten existing trust territories and 62 other non-self-governing territories where lives one out of every ten persons in the world today.

Much basic information must also be gathered since adequate data on such things as population, business activity, distribution, and productivity are lacking in many areas of the world.

After the needs are determined, steps must then be taken to establish conditions which will attract capital investment in areas needing development. In addition, according to Mr. Thorp, "economic development depends upon the normally unspectacular functions of government. They are an essential part of any program for economic progress; the establishment of internal order, security and justice; the creation of money, credit and fiscal systems; the development of basic systems of communications

and transportation; the spread of literacy and higher learning in the arts and sciences; the provision of basic health and social services; the assessment and protection of natural resources."

**I**N other words, conditions must be established so that investors will have some assurance of stability within the area, an adequate and healthy labor force, return on investment, and removal of the fears of expropriation, to mention only a few of the necessary factors.

Mr. Thorp further points out that economic development is not limited to industrialization—industrialization in the narrow sense of manufacturing, although substantial expansion of the world's manufacturing capacity is deemed vitally necessary. Also included are advances in agriculture, mining, transportation, communications, power, and in the skills and capacities of all the people.

For this reason, those working on the program, view technical assistance in its broadest concept embracing such varied activities as training in administration, in industry, and in agriculture; health programs, broad technical missions, and the dispatch of individual experts. Also experiment stations; training fellowships and local technical training institutes; dissemination of information through conferences, seminars, and publications; provision of laboratory materials; demonstration services and equipment. Also basic and vocational education; advice concerning particular industrial and agricultural projects; the improvement of fiscal systems; resource surveys and general assessment of development potentialities; analysis of methods of production, marketing and management; consultation on measures to combat inflation or to provide for displaced workers; and advice on steps designed to mobilize domestic savings for constructive investment.

### Joins Research Staff

Washington

••• Dr. Ralph L. Nuttall has been appointed to the staff of the National Bureau of Standards, where he will do research on the thermal conductivity of gases at elevated temperatures and pressures in the Thermodynamics Laboratory.

### THE BULL OF THE WOODS

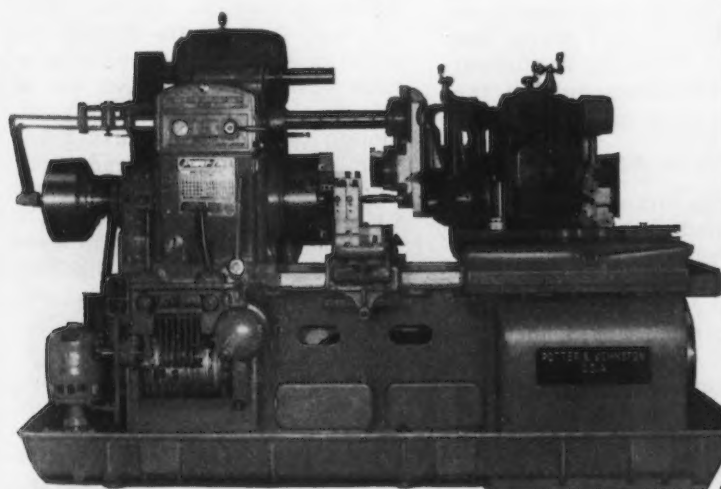
BY J. R. WILLIAMS



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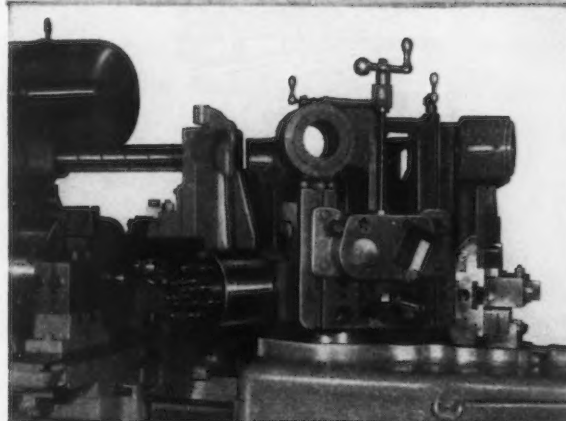
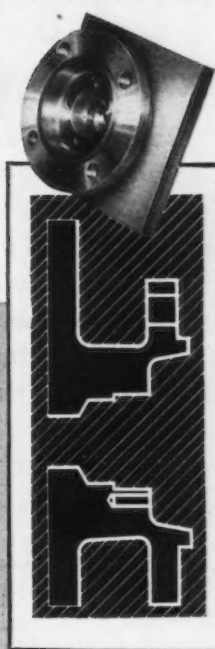
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more from between the  
flanges. Drill Head simul-  
taneously drills 8 holes.



1st TF — Step drill. Breakdown OD with 3 tools.

2nd TF — Machine 1 dia. C'bore. Face flange and  
form turn dia. Rough machine groove  
and form turn dia. Turn small flange.

3rd TF — Finish turn small flange. Chamfer. Finish  
face flange and finish form turn dia.  
Finish face large flange.

4th TF — Groove and chamfer C'bore. Chamfer  
flange and step dia.

5th TF — Size turn OD.

6th TF — Drill 4 holes in body, 4 holes in flange.

**Potter &  
Johnston Company**

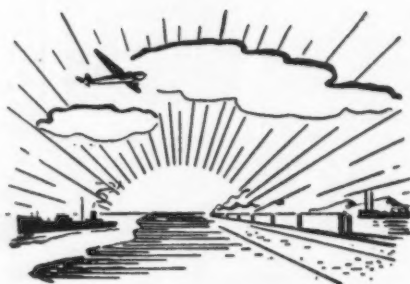
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• Oregon iron ores again evaluated... \$40 million tunnel would open rich Utah ore beds . . . New tower shop planned for Seattle . . . Live ammo in scrap damages Bethlehem furnace.



**P**ORTLAND, ORE.—Once more the question "Why does not the lower Columbia River area have a steel industry based on blast furnace products of iron ores that occur in that area?" has been answered—this time by A. O. Bartell, managing engineer, Raw Materials Survey Inc.

In an analysis of the potential use of approximately 3 million long tons of recoverable iron ore, Mr. Bartell recounts that pig iron and cast iron pipe were produced by the Oregon Iron Co. and its successors at Oswego, Ore., between 1867 and 1894. Because of the high cost involved in mining the low grade ore which had to be reached by relatively expensive underground methods, the operation proved uneconomic.

A recent report on the limonite iron ores of Columbia County, Ore., refer to this Oswego deposit as being 1½ miles in extent with its thickness ranging from 2 to 20-ft. Chemical analyses of the ore as reported by J. S. Diller in the 17th annual report of the U. S. Geological Survey, was as follows:

	Pct.
Metallic Iron .....	30.00 to 40.00
Silica .....	7.00 to 15.00
Magnesia .....	2.00 to 3.00
Manganese .....	4.00 to 8.00
Lime .....	2.00 to 4.00
Phosphorous .....	0.37 to 0.67
Sulfur .....	0.3 to 1.00

The survey reports made by the U. S. Bureau of Mines on these deposits states: The Scappoose iron ore deposits contain an estimated 4,049,000 long tons of iron ore that will average about 39.1 pct iron, 19.7 pct moisture; 0.037 pct sulfur; 0.58 pct phosphorous; 0.47 pct manganese; 4.30 pct silica; and 3.4 pct alumina.

Approximately only one third of the recoverable ore is available through opencut mining according to this survey which gives the following estimates:

	Indicated ore, long tons	Reserves Recoverable
Underground mining .....	3,102,500	2,140,000
Opencut mining .....	947,000	764,950
	4,049,500	2,904,950

It is pointed out that if the approximately 3 million tons of iron ore were mined that about 1,160,000 tons of pig iron containing 1 to 2 pct phosphorous could be produced from it.

The Bureau of Mines has also reported that because of the relatively small tonnage of ore "the means of reduction would be limited to small units, such as electric furnaces." The limited size of the ore bodies would not justify a blast furnace with a capacity of 1000 tons, or even 500 tons, of pig iron per day, as such a furnace would deplete the recoverable ore reserve within 3½ to 7 years. The capital cost for such equipment could not be returned from the limited ore reserves, the report stated.

**"T**HE pig iron made from this ore would have a high phosphorous content and would not meet usual specifications for steel-making. Any process to remove the phosphorous would increase the cost of production, possibly above the competitive price range. Possibly this ore could be utilized directly in the manufacture of cast iron pipe at a plant adjoining the furnace," it was said.

H. A. Doerner of the U. S. Bureau of Mines' laboratory at Albany, Ore., not long ago reported that the bureau's recent work on the Scappoose iron ore indicates that by nodulizing and partly reducing the ore with coal in a ro-

tary kiln, it may be possible to make a product suitable for cupola furnace feed as a substitute for scrap iron, if high phosphorous metal is acceptable.

Cost of mining this ore has been estimated by the Bureau of Mines at from 80¢ to 90¢ per long ton. It has been suggested that the ore would probably be hauled to Scappoose for reduction. These deposits are from 10 to 15 miles distant from Scappoose and the estimate has been made that the average cost of hauling the ore, including all charges would be approximately 6¢ per ton mile and that the cost of the ore delivered to the railhead at Scappoose would be approximately \$1.55 per ton.

This ore is already in demand as a paint pigment by the C. K. Williams & Co., according to B. E. McNay who told the AIME meeting at San Francisco recently that his company had already used about 3000 tons at their San Francisco plant, and that it was the best pigment material of its type in the western United States.

Mr. Bartell suggests another possible use of this ore by the heating gas producers as a sulfur absorber in their gas purification processing.

Steel producers on the Coast who have been aware of these deposits apparently are unenthusiastic about the potential use of this iron in steel production although they do state that it has possibilities for low-grade cast iron products if an economical method of reduction could be worked out. High cost of shipment to the blast furnaces in the West already well supplied with ore prohibits such a venture.

## Proposes Drainage Tunnel

*Salt Lake City*

• • • A proposed 20-mile diversion tunnel to drain the Park City and Alta mining districts would cost \$40 million and require 10 years for completion, according to a report prepared by the mining division, U. S. Bureau of Mines.

The Y-shaped tunnel, being studied as a possible unit of the

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| 1. Resistance to Rust and Corrosion | 5. Re-Usable             | 10. Lower Ultimate Cost     |
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| 3. Non-Magnetic                     | 7. Easy to Clean         | 12. Easy to Plate or Finish |
| 4. Non-Sparking                     | 8. High Strength         |                             |
|                                     | 9. Long Life             |                             |

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WRITE TO GENERAL OFFICES, DEPT. F, FOR OUR 134 PAGE COLOR CATALOG giving blue print drawings, dimensions, threads, heads and sizes of each item. Special Stainless Steel Catalog also available upon request.

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Central Utah Colorado river project, would lower the water level in the Park City and Alta districts by 1000 ft. It is estimated that to accomplish that by pumping would cost about \$1 million per year for power and maintenance plus a large original installation investment.

The Bureau of Mines estimates that the tunnel would dewater 6,500,000 tons of ore containing the following amounts of recoverable metals: lead, 530,000 tons; zinc, 269,000 tons; silver, 49,500,000 oz; gold, 77,700 oz; copper, 11,000 tons.

The drainage tunnel would make available, with low cost pumping to a depth of 500 ft, about 3,250,000 additional tons of ore.

The project is being studied on the theory that it could be made economically feasible by spreading the costs over the mining industry, irrigation and municipal water development and recreational benefits.

## New Program Assures Ample Power Supply

*Los Angeles*

• • • With 1949 already considered a "safe year" in the matter of having sufficient power for industry in southern California, Southern California Edison Co. officials have announced a construction program which will assure this area of a plentiful supply of electricity even in years of drought.

Gentle rains, which followed southern California's most "unusual" winter of snow and freeze, have raised the rainfall totals to more than double last year's dry mark. Although the total still is below normal, the rain coupled with increased facilities have been sufficient to guarantee a plentiful supply of power for this area.

This in turn will assure northern California, where some industries were pinched last year, of constant aid if necessary. Connecting power lines have been established, and power from southern California has been loaned to the northern area whenever needed.

The clincher on the expansion of power to meet growing industrial needs comes with an announcement by W. C. Mullendore,

chairman of the board of directors for Edison, that \$74,091,724 will be spent this year for further construction. This exceeds last year's total.

Nearly half of this budget will be spent on distribution facilities, while a substantial part of the balance will be expended on completion of the company's 268,000 kw Redondo steam electric station. This is at the ocean and depends upon sea water only. Another large sum will be spent to start construction this year on an 84,000 kw hydroelectric plant in the California mountainous area of Big Creek. This is scheduled for completion in 1951.

The other major southern California power utility company, the Los Angeles Dept. of Light and Power announced last week that its output was 75,483,000 kw, a gain of 6.95 pct over the like 1948 week.

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Approximately 4000 tons of structural steel is involved in these contracts. Having one of the

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The furnace had just been charged with scrap recently arrived from the Philippine Islands and after the explosion fragments of a rocket were found and it is believed that this projectile caused the explosion although initially it was thought a land-mine detonator was to blame. Other battlefield scrap now in the yards is being carefully inspected to prevent a recurrence of this accident.

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A Multipress equipped with indexing table special tooling and screwdriver hopper feeds for riveting electrical contacts, on brass and spring steel contact arms.

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MY JOB CALLS FOR . . .

- ☐ BROACHING
- ☐ STAKING
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- ☐ BLANKING
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OF \_\_\_\_\_

#### TONNAGE

There's a Multipress made to fit your needs up to and including 35 tons.

#### PRODUCTION REQUIRED

You name it! Amazing speed is what has won Multipress a place in hundreds of production plants.

The Denison Eng. Co., 1158 Dublin Rd., Columbus 16, Ohio  
Please tell me how Multipress can fit the above needs.

Name \_\_\_\_\_

Title \_\_\_\_\_

Firm \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

Zone \_\_\_\_\_ State \_\_\_\_\_

Standard Accessories and Complete Tooling Delivers  
Your **MULTIPRESS**

*Ready to Roll*

*What Are Your Requirements?*

Just size up your job requirements as suggested in the check-list at left. Then let Denison show you the Multipress that gives you highest efficiency at lowest cost. Frame sizes range from small bench units to floor models, with pressure capacities from one to 35 tons. Ram speeds up to 1300 inches per minute can give you fast production. You can have manual or automatic controls, for almost any type of ram action.

Hydraulic index tables, dial feed tables, knock-out cylinders and many other standard Denison accessories available as optional equipment. In addition, Denison's skilled tooling engineers can design and build special tooling you need, and test-prove the fully equipped Multipress using your actual production parts. You get a complete, packaged unit, *ready to roll*.

Get down your job needs on this ad — and send it today for the full story on Multipress and what it can do for you.

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# PERSONALS

• • •



HOWARD M. GIVENS, JR., general manager, tool and high speed steel sales, Crucible Steel Co. of America

• **Charles V. Masterson, Jr.**, has been appointed superintendent of industrial relations at the Gary, Ind., sheet and tin mill of Carnegie-Illinois Steel Corp., succeeding **William P. Jones**, who has been transferred to Pittsburgh as supervisor of education and training for Carnegie-Illinois.

• **Frank W. Atchison, Jr.**, has been placed in charge of the Chicago office of the Steel Construction Co., Birmingham, which is affiliated with the Ingalls Iron Works, Ingalls Shipbuilding Corp. and Birmingham Tank Co. Mr. Atchison has been associated with the Ingalls Iron Works for the past 14 years.

• **Harry H. Bascom**, who has been assistant traffic manager in charge of Chicago traffic department, Youngstown Sheet & Tube Co., Youngstown, retires, effective April 30, after more than 32 years of service.

• **R. H. Musser** has been appointed district sales representative in Philadelphia for the Heppenstall Co., Pittsburgh, succeeding **S. J. Mergenhagen**, who has been named assistant sales manager.

• **S. Floyd Stewart** has been named president, Leece-Neville Co., Cleveland, succeeding **B. M. Leece**, who died. Mr. Stewart joined the company in 1936 as a research engineer and has served as executive vice-president since 1946. **C. S. Cook** has also been named vice-president of Leece-Neville. For the past 8 years Mr. Cook has served as assistant to the president and was recently appointed treasurer and elected to the board of directors.

• **Willard F. Rockwell, Sr.**, chairman of the board, and **Willard F. Rockwell, Jr.**, president, Rockwell Mfg. Co., have been elected to the board of directors, Acro Switch Co., Cleveland. **F. G. McCloskey** has been named president; **John H. J. Pearce**, sales manager. **Arthur F. Kroeger** and **Frank P. Maxwell** have also been elected directors of Acro.

• **Edward D. Wiard** has been named to represent Illinois Tool Works in the Detroit territory, with his headquarters in that city.

• **John M. Mulholland**, formerly manager of railroad sales, has been named traffic manager of the Youngstown Sheet & Tube Co., Youngstown.

• **J. P. Vederko** has been appointed works manager of the Hydraulic Press Mfg. Co., Mount Gilead, Ohio, succeeding **E. J. McSweeney**, formerly vice-president in charge of manufacturing, who resigned recently. Mr. Vederko had formerly been general superintendent of the Cross Co., and prior to that served with the Ex-Cell-O Corp.

• **R. D. Cortelyou** has been appointed Pacific coast manager for A. Milne & Co., New York, with headquarters in San Francisco. Mr. Cortelyou has been connected with the steel industry on the Pacific coast for many years.

• **Harry S. Hagan** has been appointed manager of the Butler, Pa., freight car plant of Pullman-Standard Car Mfg. Co. Mr. Hagan had served as acting manager of the plant for the past year.

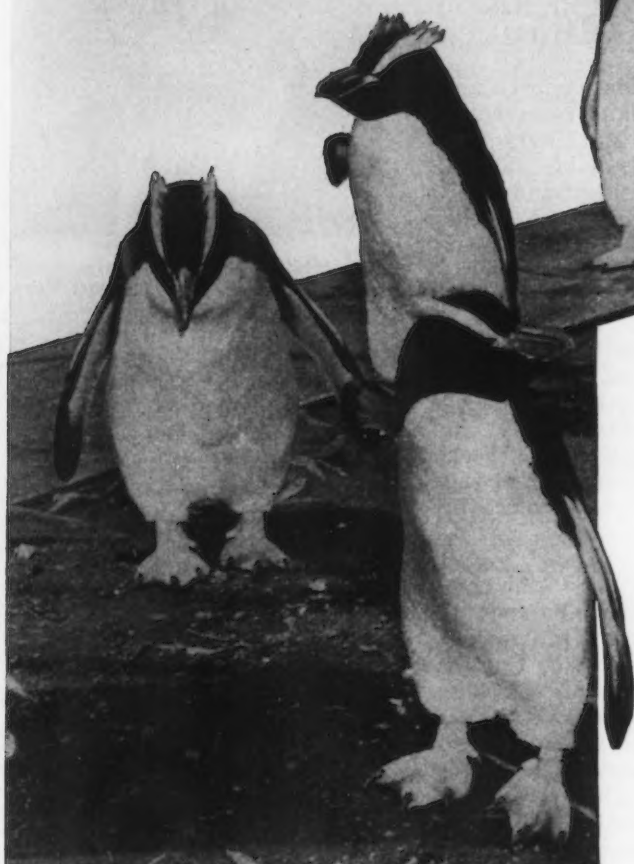
• **Jack P. Williams, Jr.**, has been appointed California representative for Syncro Machine Co., Perth Amboy, N. J., with his office in San Francisco. He had formerly represented the company in the Chicago territory, and is well-known in the wire industry.

• **J. H. Oakes** has been named sales manager, enclosed drives, Link-Belt Co., with headquarters at the company's Philadelphia plant. He is assisted by **Harry F. Kurz** as representative, enclosed drives, with headquarters at the Pershing Road plant in Chicago.

• **John H. Loux** has resigned his connection as Chicago representative for Loftus Engineering Corp., to devote his full time to the installation of industrial communication and electronic equipment for Farmers Engineering & Mfg. Co., Pittsburgh, retaining his offices in Chicago.

• **James T. Gow** has been appointed chief metallurgist for the Electric Steel Foundry Co., Portland, Ore. For the past 13 years Mr. Gow has been associated with Battelle Memorial Institute, where he has been supervising metallurgist in industrial metallurgical research.

When these penguins escaped from the Washington Zoo, they led pursuers on a merry chase until they were captured in the Potomac River.



## why prize uniformity?

**D**ictionaries define uniform as "being the same or alike." The ferro-alloy consumer who works with steel ingredients will tell you uniformity is mighty important.

**T**he Philo and Rainier brand seals of the Ohio Ferro-Alloys Corporation are your guarantee of uniformity in the agents used for deoxidizing, alloying and degasifying metal.

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**H. C. FERRO-CHROME • FERRO-MANGANESE**

**SIMANAL • BOROSIL**

**BRIQUETS •**

**SILICON • MANGANESE • CHROME**

**SILICO-MANGANESE**



*Ohio Ferro-Alloys Corporation*  
*Canton, Ohio*

Chicago   Detroit   Pittsburgh   San Francisco   Tacoma





**BRUCE F. OLSON**, president and general manager, Sundstrand Machine Tool Co.

• **Bruce F. Olson**, formerly vice-president, has been elected president and general manager, Sundstrand Machine Tool Co., Rockford, Ill., succeeding his father, **Hugo L. Olson**, who died. **O. G. Nelson** has been elected chairman of the board of the company. **Gust. H. Ekstrom** and **Gilmore J. Landstrom**, directors, have been elected vice-presidents, and **Howard H. Ekstrom** has been appointed assistant secretary and treasurer.

• **Russell J. Skinner** has been appointed assistant district manager of the United States Steel Supply Co. at St. Louis. Mr. Skinner, who started with the company in 1933, had been office manager in St. Louis since 1946.

• **O. T. Henkle** has been elected president of Mercury Mfg. Co., Chicago, filling the vacancy caused by the death of **Arthur G. Leonard**. Cofounder more than 35 years ago, Mr. Henkle has been secretary and treasurer of the company for many years. Since his retirement from the position of vice-president and general manager of the Union Stock Yard & Transit Co. in 1944, he has devoted his time and attention to the affairs of Mercury.

• **W. A. Radford** has been appointed New York representative for the A. H. Ross Co., Inc., Dayton, Ohio.

• **Fred A. Pritzlaff**, foundry superintendent for the past 15 years, becomes consultant on foundry problems to the vice-president and works manager for the Falk Corp., Milwaukee. In addition to his consulting duties, Mr. Pritzlaff continues responsibility for pattern shop operations. **Carl Haertel** has been appointed foundry superintendent. Mr. Pritzlaff has served 47 years in the Falk foundry and Mr. Haertel entered foundry work in 1924.

• **David S. Reynolds** has been appointed New England representative for the Gas Machinery Co., Cleveland. Mr. Reynolds retired in 1947 as vice-president and chief engineer of the Boston Consolidated Gas Co., and has since that time acted as consultant to several gas companies in New England.

• **Gilbert H. Coughlin** has been named manager of the newly-opened district sales office of Pittsburgh Steel Products Co. in Dallas. **James A. Olds** has been appointed district manager of the new Pacific Coast sales office in San Francisco.

• **J. A. Packard** has been appointed manager, original equipment sales; **L. C. Butler**, manager of service sales, and **B. S. Tooker**, service manager, all of the Transmission Div., Fuller Mfg. Co., Indianapolis. Mr. Packard joined Fuller as sales engineer in 1942. Mr. Butler joined the service department of Fuller in 1934 and had served as assistant service manager and as service engineer. Mr. Tooker has been associated with Fuller since 1942 and has had wide experience with problems connected with field service.

• **Robert E. Rielly** has joined the Chas. Taylor Sons Co., Cincinnati, as assistant to the vice-president in charge of sales. Mr. Rielly assists in the supervision of the company's national advertising program and performs sales duties.

• **Robert L. Burke** has been appointed general manager of Wyzenbeek & Staff, Inc., Chicago. Mr. Burke had previously been connected as works manager with Barnes & Reinecke and is well-known in the metalworking industries.



**A. R. MEYER**, assistant sales manager, National Supply Export Corp.

• **A. R. Meyer** has been appointed assistant sales manager of the National Supply Export Corp., New York, supervising the work of all departments of the New York office and assisting in other activities of the export corporation directed from New York. Mr. Meyer joined the sales department of National Supply in Toledo in 1929. From 1946 until his present appointment he had served as American representative in New York for Oil Well Engineering Co., Ltd.

• **Willard D. Peterson** has become associated with Arthur D. Little, Inc., Cambridge, Mass., in a consulting capacity. Dr. Peterson had previously served as associate director of research and development at J. T. Baker Chemical Co.

• **Harry M. Brostoff**, for the past six years operating vice-president of the James Flett Organization, Inc., Chicago, has resigned to resume private law practice, effective April 1. He continues as general counsel for the scrap sales agency, a post he has held for two decades.

• **E. Corbin Chapman** has been named chief metallurgist of Combustion Engineering-Superheater, Inc., New York. Mr. Chapman has been employed by Combustion since 1928. He continues to make his headquarters in Chattanooga, Tenn.





**J. L. YOUNG, JR.**, manager, southwestern sales, Wolverine Tube Div., Calumet & Hecla Consolidated Copper Co.

• **J. L. Young, Jr.**, has been promoted to manager of southwestern sales, Wolverine Tube division, Calumet & Hecla Consolidated Copper Co., Detroit. Mr. Young had formerly been sales representative for the Wolverine Div., with headquarters in Houston, where he continues to maintain his offices.

• **Richard A. Brown** has been appointed supervisor of commercial scheduling in the construction materials department of General Electric Co., Bridgeport. **William W. Marden** has been named supervisor of order service. **Fay C. Ralph** has been appointed commercial engineer for the division. **Lyde E. Howard** has been appointed sales manager, electric utility sales, Wire & Cable Div., with headquarters in Schenectady. **James F. Farnam** has been appointed sales manager, industrial and contractor sales, Wire & Cable Div., Bridgeport. **W. J. Delehanty** has been appointed sales manager, Oakland Section of that division at Oakland, Calif. **Walter S. Hay** has been named manager of transportation, federal, state and municipal sales for the division at Bridgeport. **John J. Curtin** has been appointed manager, magnet wire sales of the division at Schenectady. **G. Bryan Shanklin** has been appointed manager of commercial

engineering for electric utilities for the Wire & Cable Div. in Bridgeport. **Reginald B. McKinley** has been appointed manager of commercial engineering, industrial and transportation for the division at Bridgeport.

• **James H. Fraser** has been named assistant to the president, International Machines Corp., New York. Mr. Fraser had previously served as IBM manager at Charleston, W. Va. **Charles M. Mooney** has been appointed special representative on engineering development for the company in New York. He had previously served as a sales representative at Washington, D. C., for more than two years, having had charge of the IBM program of War Dept. activities.

• **O. D. Niedermeyer** has been appointed manager of the Texas Mining & Smelting Div., National Lead Co., directing the company's antimony smelting operations. Mr. Niedermeyer joined National Lead in 1948, managing the company's Mexican antimony mines, and before coming to National Lead was general manager of tin mines in Bolivia owned by Companio de Oruro.

• **J. M. Roche** has been named director of a new centralized public relations department of Cadillac division of General Motors Corp., Detroit. **C. H. Smith** has been appointed divisional comptroller, succeeding **W. B. Wardle**, who becomes special assistant to the general manager.

• **Guy R. Buchanan**, assistant to operating vice-president, Santa Fe Railway at Chicago, has been named general manager of the Panhandle & Santa Fe Railway, succeeding **G. C. Jefferis**, who died. Mr. Buchanan is succeeded in Chicago by **W. L. More**, assistant general manager from La Junta, Colo.

• **Leo R. Smith** has been appointed freight agent for the Erie Railroad in the Olean, N. Y., office, succeeding **F. J. Duggan**, who has retired. Mr. Smith has spent 27 years in Erie service. **Chester D. Carnes** has been promoted to freight agent at Corry, Pa., succeeding Mr. Smith in that capacity. He has been connected with the Erie for almost 20 years.



**THOMAS W. ALDER**, executive vice-president and treasurer, Barnes & Reinecke, Inc.

• **Thomas W. Alder** has been appointed executive vice-president and treasurer of Barnes & Reinecke, Inc., Chicago. Mr. Alder served for many years as secretary of Von Lengerke & Antoine, and later as president of Blake Mfg. Co.

• **Kenneth F. Vilsack** has been appointed Chicago district sales representative of Kerotest Mfg. Co., Pittsburgh. Mr. Vilsack had previously served in the Pittsburgh general sales office.

• **Arthur B. Austin**, formerly assistant manager of the Hercules Powder Co. explosives office in Chicago, has been named manager of the Joplin, Mo., explosives office, succeeding **M. W. Latimer**, who died. Mr. Austin joined Hercules in 1933 at Wilmington, Del.

• **R. S. Bradley** has been promoted to director of research and engineering, A. P. Green Fire Brick Co., Mexico, Mo. Mr. Bradley has been with the Green Co. since 1923. He had been director of research there before his promotion.

• **Gordon R. Fritch** has been appointed office manager of Meier Brass & Copper Co., Detroit. Mr. Fritch had previously been connected with the Doss Steel Research Co.



**S. W. CORBIN**, assistant manager of the industrial divisions, Apparatus Dept., General Electric Co.

• **S. W. Corbin** has been appointed assistant manager of the industrial division of the Apparatus Dept., General Electric Co., Schenectady. Mr. Corbin, who joined GE in 1930, is also manager of the resale industries division, a position he assumed in 1943 and which he retains along with his new appointment.

• **George E. Stoll** has been appointed a vice-president of Bendix Aviation Corp. Mr. Stoll joined Bendix in 1929 and since 1946 has been general manager of the Bendix Products division at South Bend, Ind. **Lawrence A. Hyland** has also been named vice-president of Bendix in charge of Bendix aviation research. He had formerly been executive engineer and has been associated with the company since 1937.

• **Russell L. Hibbard**, formerly assistant director of the Unemployment Compensation department of the Wisconsin Industrial Commission since 1934, has been appointed director of the unemployment compensation activities on the central office personnel staff of General Motors Corp., New York.

• **Frank Eckert, Jr.** has joined the sales staff of Eastern Brass & Copper Co., New York. Mr. Eckert had formerly been associated with Western Electric Co.

• **George B. Markle** has been named manager of tire sales and **H. T. Goodenberger**, merchandise manager, Associated Lines Sales division of the B. F. Goodrich Co., Akron, Ohio. Mr. Markle has been connected with the company 23 years and for the last several years has served as division merchandising manager. Mr. Goodenberger joined Goodrich 20 years ago. He became field budget manager of Associated Lines in 1936. In 1947 he was named manager of distributor development, a post he held until his present appointment.

• **John W. Ingold** has been made retail sales manager of the plumbing and heating buying department of Sears, Roebuck & Co., Chicago. Mr. Ingold, who has been with the company since 1931, served as a buyer in that department since 1941. He succeeds **Arthur J. Natemeyer**, who has been promoted to head of the building materials buying department.

• **J. J. Morsman** has resigned as a member of the board of directors of National Lead Co., New York. He has been with the company 56 years, beginning as an engineer with the Carter White Lead Co. in Omaha. He later served successively as treasurer, vice-president and president of that company. In 1929 he became assistant manager of the Chicago branch of National Lead Co. and 9 years later was elected a director.

• **M. H. Blank** has been appointed representative in the Detroit area to handle gears and gear units sales for the Buffalo plant of Farrel-Birmingham Co. Inc., Ansonia, Conn. Mr. Blank's offices are located in Detroit.

• **Robert W. Stoddard**, vice-president of the Wyman-Gordon Co., Worcester, has been elected a director of the Boston & Maine Railroad, succeeding **Aldus C. Higgins**, who died.

• **Harold E. Huber** has been appointed head process engineer of the Votator division of the Girdler Corp., Louisville, Ky. Mr. Huber joined the Girdler firm in 1943.



**C. H. SMITH**, superintendent, body division, Studebaker Corp.

• **C. H. Smith** has been appointed superintendent of the body division, Studebaker Corp., South Bend, Ind., succeeding **George M. Fisher**, who has retired. Mr. Smith joined Studebaker in 1925. In 1942 he was named general foreman of the Studebaker aviation plant in Chicago. For the last four years he has been assistant superintendent of the body division.

• **C. W. Floyd Coffin** has been elected vice-chairman of the board, American Arch Co., Inc., New York, replacing **B. A. Clements**, who has retired. **Frederick A. Schaff**, **Arthur F. Becker**, and **Roger L. Wensley** have been elected directors.

• **E. W. Carey**, director of personnel, U. S. Gypsum Co., Chicago, has been elected a vice-president of that organization.

• **John M. Nelson** has been made manager of meter sales of the meter division in Newark, N. J., for the Westinghouse Electric Corp., Pittsburgh. **J. F. Chapman** has succeeded Mr. Nelson as manager of relay sales. Mr. Nelson joined Westinghouse in 1926. Mr. Chapman has been with the company since 1930 and has served in various capacities in the meter division engineering department.



## OBITUARY

• **Jeffrey M. Taylor**, connected with the National Foundry Association for 44 years, died in Chicago Feb. 15.

• **Harold G. Irwin, Jr.**, treasurer, Irwin Mfg. Co., Inc., Garland, Pa., died Feb. 16.

• **James O. Colley**, 83, retired general superintendent, Alabama By-Products Corp., Birmingham, died March 1.

• **Harry S. Richardson**, 70, formerly control engineer with Electric Controller & Mfg. Co., Cleveland, died Feb. 25. He had been associated with the company 45 years before retiring last October.

• **James A. Wright**, 56, vice-president and general manager, Morse Twist Drill & Machine Co., New Bedford, Mass., died March 3.

• **Andrew Van Dean Willgoos**, 60, chief engineer, Pratt & Whitney Aircraft Corp., Hartford, died March 1.

• **Benson C. Beach**, 79, founder and president, Beach Foundry, Ltd., Ottawa, died recently.

• **Henry J. Davis**, 83, retired general manager of Carnegie-Illinois Steel Corp. in Clairton, Pa., died March 1.

• **R. Blair Hastings**, 45, superintendent of the openhearth division of Republic Steel Corp., Cleveland, died March 7.

• **John P. Gangwisch**, retired president of Pittsburgh Tube Co., Pittsburgh, died March 4 at Tucson, Ariz.

• **Harry P. Anderson**, 58, secretary-treasurer, American Bridge Co., Pittsburgh, died March 7.

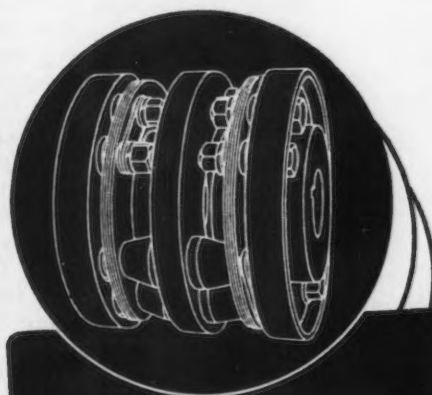
• **Theron G. Councilor**, vice-president, controller and a director of Copperweld Steel Co., Pittsburgh, died recently.

• **F. M. Manson**, 59, former traffic manager for Lukens Steel Co., Coatesville, Pa., died recently.

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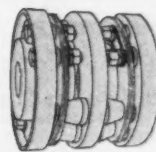
## THOMAS

### *flexible* COUPLINGS

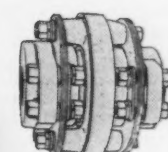
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Angular and Parallel  
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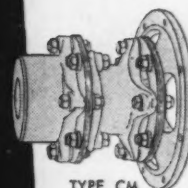
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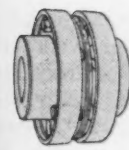
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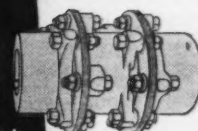
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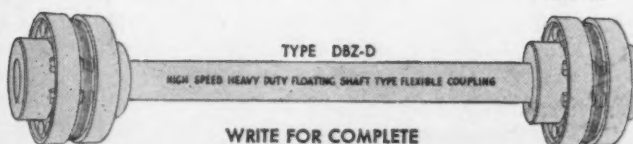
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TYPE AM



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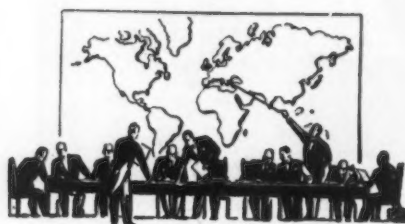
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# European Letter . . .

• Turning point at hand in field of Atlantic relations . . . Western Powers must not waste time in speculation regarding changes in Soviet regime . . . World does not revolve around the Kremlin.



THE ministerial changes announced with the customary curtness from Moscow a week ago have set off a worldwide bout of speculation. Some think that Mr. Molotov and Mr. Mikoyan were the leaders of two opposing schools of thought in the Kremlin, those of intransigence and of compromise, and that the departure of both of them from their Ministries is Mr. Stalin's way of imposing a middle course. Others think, on the contrary, that these two Old Bolsheviks, who remain Deputy Premiers, are being moved to posts nearer the throne, a throne that may be vacant before long, and that their translation is more promotion than the reverse.

The plain truth is that nobody outside Moscow knows what it means, or will be able to do more than guess at the meaning until the evidence gradually accumulates. This being so, there is some danger in too much speculation. For one thing, if so much importance attaches to what is done in Moscow, it encourages the belief that the world revolves round the Kremlin and that the initiative in the cold war lies with the Soviets. What matters is not what Moscow does

but what the West does, and it is a pity to divert public attention from the job in hand. And secondly, there is a danger that some of the analysts of Russian motives may be so sure they are right that they press for some corresponding change in the western attitude. This is a very different matter, for once conclusions begin to be drawn from the mass of speculation, it can only mean that one guess is given preference over another guess and that somebody somewhere is claiming that his diagnosis is correct. Yet, if the western powers are asked the straight question: Which of all these reports is, in fact, true, there is only one honest answer they can give—we do not know. And it is surely safer to take this acknowledged ignorance as the basis of western policy rather than diagnoses whose validity cannot be checked.

THIS is not simply a theoretical point. The western powers are engaged at the moment on an arduous and in many ways perilous task. They are building for the first time in their joint histories a regional structure of security, political unity and economic cooperation. Its pillars are the Atlantic Pact, the Council for Europe and the various agencies of the Marshall Plan. Almost every move in this effort of

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construction is new. Every fresh development demands a concentration of energy and purpose which it is difficult for democracies with their lax methods and easy-going traditions to sustain. Meanwhile, the Russians, who choose to see in the Atlantic world's regional effort a menace to the regionalization of Eastern Europe they carried through at breakneck speed after the war, are now bent on using every device of propaganda and pressure to prevent the completion of the structure. As the western powers toil painfully up and down the scaffolding, the Russians and

their satellites stand on the other side of the fence, jumping up and down, whistling, chanting slogans, flinging a few stones and every now and then, advancing to the foot of the ladder to ask whether the weary builders will not come down for a nice cup of tea and a chat. It is all rather disturbing and at times tempting. But the western builders have only one duty—which is to get the roof on to their building. Until they have accomplished so much, attention to what the Russians are doing is not only useless. It is a dangerous waste of time.

IN the last six weeks, the Russians have made two different attacks upon the Atlantic Pact. The first belonged to the "cup of tea" class. Stalin gave his interview to an American newspaperman proposing peace talks *à deux* with Mr. Truman. At about the same time, M. Cachin voiced the views of local Communists by appealing for a general peace settlement. When, however, the talks for the Atlantic Pact continued undisturbed, the next move was a hail of small stones. In order to play on the European powers' understandable dread of civil war, each local Communists leader made his promise that in the event of war between Russia and the West, the Communists would be on Russia's side. It is not likely that these diversionary tactics will be the last. It is even possible that the changes in office in Moscow may herald an intensification of the effort, in either or in both directions. The important point for the western powers is, therefore, not to rack their brains assessing Moscow's next move, but to continue with the steadiness they have shown so far to concentrate on their own efforts, and to spare not a backward glance to the antics of the men on the other side of the fence.

This need for concentration will be even greater in the next six months than it has been in the testing year just passed. In some

ways the pressures which led to the great effort of western cooperation have relaxed. In spite of Russia's activities, the actual fear of war is less. Thanks to the success of the first year of Marshall aid, the threat of economic collapse has passed. The western powers no longer face an acute crisis. They face a number of unfinished ventures, all good in themselves, into which, nevertheless, they entered under the impulsion of crisis. It is a situation in which a slackening of effort and the diversion of attention become much easier, and the temptation grows to believe that such ambitious projects are, perhaps, not necessary after all.

**T**O counter this mood greater efforts, greater imagination, greater concentration of purpose are needed. Each of the three great enterprises of western Europe is entering its decisive stage. The

Atlantic Pact will soon be signed and then will come the challenging concrete decision on what its precise military implications are. The Council of Europe is to be inaugurated shortly. Then will come the time to establish what sacrifices of sovereignty will, in fact, be made. The economic cooperation of Europe within the Marshall Plan may soon face the end of the abnormal period of inflation, shortages and sellers' markets. Then will come the time to decide whether under more normal conditions plans for close collaboration can be realized. In short, in the whole field of Atlantic relations, a turning point has been reached. It is, therefore, essential that the policies now pursued should be dictated solely by western needs and western vision and not by ill-judged defensive reactions to Moscow's moves.

tons of scrap iron and steel.

Production of ferroalloys in January was 21,931 net tons as compared with 23,708 tons in December and 17,125 tons in January 1948. For January this year output by tonnages included ferrosilicon, silicomanganese, ferromanganese, ferrochrome, chrom-x and ferrophosphorus.

## Named to New ECA Post

Washington

• • • Establishment of a Technical Assistance Arrangements Branch in New York City and the appointment of William A. Kimbel, South Carolina newspaper executive, as field director of the branch, has been announced by the Economic Cooperation Administration.

The branch, located at 2 Park Ave., will begin full operation on Mar. 14 and will deal exclusively with ECA's technical assistance program within the New York area, making arrangements for the visits to the United States of management and labor representatives of Marshall Plan countries who will come here to study production methods and techniques.

In this connection, it will assist the U. S. Section of the Anglo-American Council on Productivity.

## Swedish Workers Tour U. S.

Washington

• • • A 12-man Swedish labor delegation was scheduled this week to begin a 2-week industrial tour of this country. The group is made up of top executives in Swedish labor unions.

After meetings with representatives of the CIO, AFL, and members of Congress, the subsequent industrial trip included visits to the Bethlehem Steel Co. shipyards, Sparrow's Point, and coal mines near Pittsburgh.

At Pittsburgh the group will also inspect a large trucking depot, a detinning plant and a steel factory. Parts of the group will also see other types of industrial operations in Pittsburgh. The group is scheduled to go to Cincinnati and other industrial cities.

further use of producing companies and 10,704 tons for sale; 14,719 tons of foundry iron and 14,120 tons of malleable iron, all the latter two grades being made for sale.

Charges to blast furnaces in January included 325,403 tons of iron ore; 39,380 tons of mill cinder, scale, sinter, etc., and 8921

**SHORT CUT:** Clarence R. Morris, vice president of Lundberg Screw Products Co., Lansing, Mich., is discussing a test stud made from Jones and Laughlin's Electreat steel with James P. Ryan, foreman of automatic screw machine department. It is claimed use of these steels eliminates need for salt bath hardening and tempering of numerous small parts. The machine is a 6-spindle automatic screw machine, 2½-in. capacity, made by Acme-Gridley, Cleveland.



## Canadian Iron Output Up

Toronto

• • • Canadian pig iron production in January was 183,074 net tons for a daily average of 78.5 pct. of rated capacity. This compares with 174,233 tons in December or 74.7 pct., and with 160,042 tons or 68.6 pct. for January 1948. During January 1949 output included 154,235 tons of basic iron of which 143,531 tons were for



• **COAL AND STEEL**—Quick ending of the last coal strike, in July, 1948, found steel mills with above-average coal stocks, much of them in low grade coal. Since then their coke ovens have been working off this material in homeopathic doses, though a lot is still left. Meanwhile easing in coal demand permitted many big steel companies to boost stocks of metallurgical grade coal by outside purchases. They were not only preparing for a coal strike at the end of the contract, June 30, but for some action by Mr. Lewis to cut above-ground stocks before that time. New coke ovens have also enabled some mills to lay down huge coke stocks, too. This year for the first time these stocks made it unnecessary to cut steelmaking operations in Pittsburgh when the beehive operators walked out. It is believed that Government estimates of coal stocks at coke ovens are very conservative.

• **PAYROLLS OFF**—Although industrial payrolls as a whole were off in January from December levels, the total remained above that of a year ago, particularly in the durable goods manufacturing industry, according to the Office of Business Economics. Despite payroll drops, dividends and other income payments kept January personal income at an unchanged rate—\$221 billion annually.

• **NEW FIRM**—A new company, called the Rust Process Design Co., has been formed to take over the expanding activities of the process engineering division of the Rust Engineering Co., Pittsburgh. Four experienced process engineers from the former division were named as an executive committee. They are: Walter L. Bass, Dr. John A. Patterson, Leonard A. Wasselle and Dr. Wendell W. Waterman.

• **STEEL PAYROLL TOPS**—January payroll of the iron and steel industry, is estimated at \$202,057,000 by the American Iron and Steel Institute. This is an all time high for January. It is 12 pct above January, 1948. Only higher monthly payroll was December, 1948, when wage earners worked an average of one hour per week longer.

• **FAST MOVE**—As part of Inland Steel Co.'s modernization and improvement program they moved their 40-in., 5-stand tandem mill to a new location in the Indiana Harbor Works plant. The new position is 120 ft from the old position. The mill was back in operation in its new position 8½ working days after output was halted for moving.

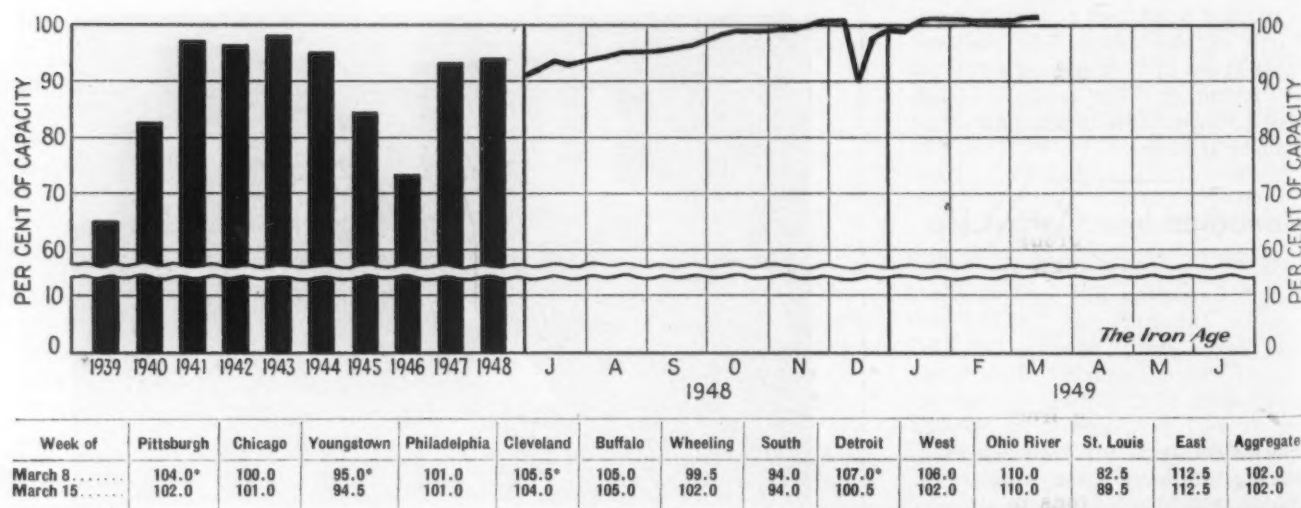
• **OIL GOODS**—With the exception of pipe, large suppliers of oil country goods in Dallas told THE IRON AGE, supplies are adequate. On the average the mills are a month behind on deliveries of casing, drill pipe, and small line pipe. Some executives expect these items to catch up late in the year. As yet the mills have not indicated more tonnage for deliveries later in the year. The gray market on pipe, so prevalent all last year, has disappeared. The real crux of the oil country pipe supply hinges on whether present drilling schedules are maintained. Those schedules to a great degree are dependent on the price of crude and this price may drop any time. A 10 pct decrease in the drilling of new wells, oil experts told THE IRON AGE, would quickly balance pipe supply with demand as far as the Midcontinent area is concerned.

• **ELECTRICAL EQUIPMENT DELIVERIES**—On Jan. 1, 1947, order backlog for ordinary factory size electric motors was 2,600,000. At the beginning of this year it was 300,000. In giving these and other equipment figures, Tomlinson Fort, Westinghouse manager of central station sales, noted that increased capacity and production line improvements are sharply reducing abnormal postwar equipment backlogs. Distribution transformer production today is ten times what it was during the war, he said, and many standard ratings have moved from a 10-month to 2-year delivery to a stock basis. In switchgear the problem today is fast becoming one of keeping the company's expanded facilities loaded rather than one of increasing output, he concluded.

• **COKE AND IRON DEAL**—While it is known that General Motors has a hand in many a steel and iron operation, few of these arrangements have come to light. This week Pittsburgh Coke & Chemical Co., Pittsburgh, disclosed that a battery of 35 new coke ovens will be installed at its Neville Island plant. G-M will pay for 20 of the ovens in a 5-year deal beginning Sept. 1, 1949. Under it, G-M will buy pig iron, furnace and foundry coke. Outside blast furnace support will be used for the pig iron so that the Pittsburgh company can continue normal merchant iron shipments to its regular customers.

• **FREIGHT CARS**—Freight car deliveries during February totaled 10,315. According to American Railway Car Institute, this is the third highest month since the program calling for 10,000 cars a month was started in March, 1947. January output was 8913 cars.

Steel Ingot Production by Districts and Per Cent of Capacity



\* Revised.



# Industrial News Summary—

- Long Coal Strike Would Hurt
- Labor Troubles Just Starting
- Scrap Shows Further Weakness

**A** TWO-WEEK coal mine shutdown won't hurt the steel rate. But if it lasts longer than that steel people will begin to worry. If it runs 3 or 4 weeks all self confidence over the large coal stockpile will disappear. In its place will be anxiety lest a second coal strike in July would deplete the coal stocks to a point where it would hurt.

It now looks as if steel people are in for a lot of labor headaches before the year is much farther along. Just as John L. Lewis is laying the groundwork for some more surprises in July the United Steelworkers are quietly getting ready for one of their biggest fights on social security and pensions.

Around the beginning of May steel firms will receive notices from the union for a wage meeting to be held in June. Some agreement should be reached by the middle of July—or the industry will face an impasse.

There is one thing certain. Phil Murray will push the demand for social security and pensions to the hilt—stopping short perhaps of an actual strike. The union has the right to strike in its contract on the question of social security and wages.

It is doubtful if wages will be the paramount issue this year in steel negotiations. It is unlikely that Mr. Murray will continue to accept the short end of the stick on social gains as long as Mr. Lewis' United Mine Workers have been able to wring out a large pension for their members and may even try to get more money via that route this year.

This week it looks as if steel leaders will get quite a public drubbing at the hands of both Messrs. Lewis and Murray. First quarter earnings are expected to be the biggest in the post-war period due to (1) better efficiency, (2) lower scrap price, (3) lower fuel prices and (4) a sustained high operating rate. No matter what present earnings are steel people will insist that first quarter returns covered past conditions and that any new labor costs would have to come out of future business—which does not look too rosy.

**T**HE joker in the demand for social benefits is that such items have as much effect on steelmaking costs as do wage increases—sometimes more because they go on and on. For that reason steel leaders privately say that if they are forced to pay more in wage costs higher prices will have to bear the load.

This means that as far as regular mill prices are concerned there is no chance that base steel quotations will be lowered this year—unless the bottom falls completely out of the steel market, which is a remote possibility this year. Or unless a steel price war breaks out and it is too soon to look for that.

The steel consumer is much confused by the turn of things this week. He is not sure how far off his business will go. Nor does he know if the coal strike now, and maybe one later, will interfere with his steel supply. Being right in the middle of an inventory reduction program he is beginning to get the jitters.

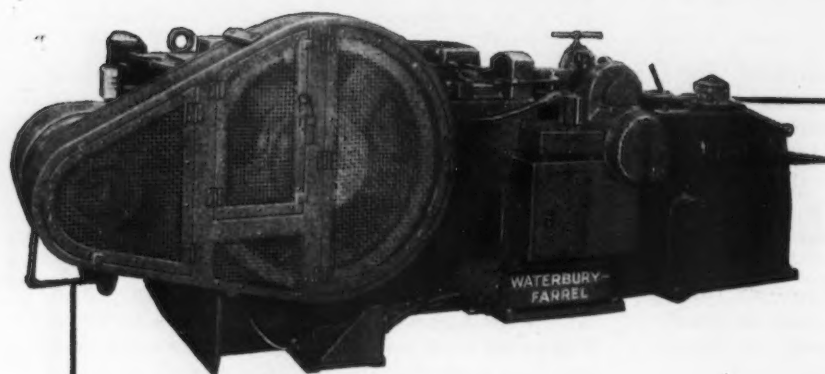
The steelmaker is no better off than the buyer of steel. He knows that his backlogs aren't worth a hoot if the trend in steel buying starts going down too fast. Cancellations now being received cannot be laughed off. They are multiplying. But they are being replaced by firm orders as fast as the holes open up.

While the coal strike and coming steel labor demands worry some people, and while the steelmaker and steel user try to find out which way the wind will blow, the output of steel is solving some of their problems. For the eighth straight week steel ingot output is over 100 pct. This week it is at 102 pct, unchanged from last week. It will be there next week and the next—or close to it.

**F**OR the next several months steel will be tight as most consumers rely on regular mill sources for what they need. Conversion deals are still being tossed out except in the case of steel needed for large gas pipe lines. Another straw in the wind which is turning into a big reed is that some steel firms are talking to other steel company customers—offering tonnages of hard-to-get steel. This trend is on the upgrade. It also means that steel firms with prices higher than the average are going to have to knock them down to regular going prices pretty soon—if they expect to keep their customers.

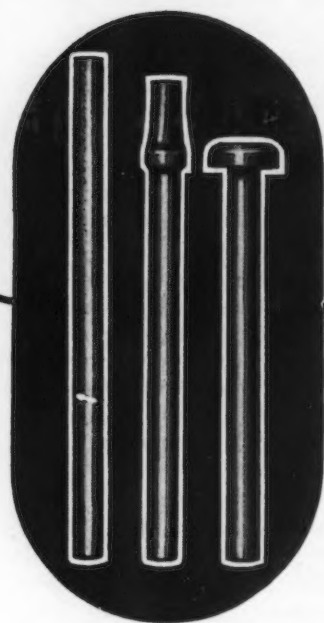
Just to further confuse the trade the scrap market this week is as weak as a kitten. Not only have heavy melting grades dropped at Philadelphia again but minor grade prices have fallen sharply. Steel mills are not sure when they will want large tonnages of scrap. They are not buying but dealers' yards are piling up. THE IRON AGE steel scrap composite this week is down 67 cents a gross ton to \$35.58 a gross ton—the lowest price since July 1947.

# New WATERBURY "HI-PRO" HEADS 150 ( $\frac{1}{4}$ " x 3") BLANKS PER MINUTE From AJAX-HOGUE Drawn Wire



Waterbury "Hi-Pro" header with  
AJAX-HOGUE wire drawer  
attached.

Other side of same header showing  
AJAX-HOGUE drawer at left.



$\frac{1}{4}$ " x 3" blanks  
drawn and headed  
on the machines illus-  
trated.

● The New Waterbury-Farrel Hi-Pro solid die, double stroke crank header achieves a new high in fast, uniform cold heading of blanks to 3 inches in length. A most important contributing

factor to this exceptional performance is the Ajax-Hogue drawer which provides the header with freshly drawn, clean, straight wire of unvarying accuracy. Ajax-Hogue wire drawers are built in five sizes with capacity from  $\frac{1}{4}$  inch to 1 inch diameter to be used with every make of cold header. Write for bulletin No. 111 for more complete information.

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NEW LONDON, CONN.

## Phillip Murray Ready for Last Ditch Fight on Social Security

### New York

• • • Philip Murray is convalescing from a recent operation. Holding this active Irishman down to a strict do-nothing routine is getting difficult. He is already loaded for bear. This is a sign that steelmakers will find a tough bargainer when wage negotiations open up with U. S. Steel about June 15.

Within the next several weeks the United Steelworkers of America will be sending out their 60-day notices calling for wage and social security talks. The notices will reach steel heads by May 15, a meeting is expected by June 15 and some kind of an agreement is called for by July 16. In the present contract the union has the right to strike on both wages and social security—other parts of the contract run until 1950.

One thing is certain. Phil Murray will put up the biggest drive and push in his life on social security for steelworkers. It has been in the back of his head for years. Better vacations, sick benefits, life insurance and pensions are the items which will make steel people run to cover and study costs. Part of this program is old business. U. S. Steel has been studying the social security package since 1947. At that time they agreed to negotiate to a finish on the problem.

The finish has not come yet but it will this year. There will be no more carryovers on the 1947 social security promise. For months on end a special department of the U. S. Steel of Delaware has been making an exhaustive—the word is exhaustive not exhausting—study to present at negotiating meetings. But that study does not contemplate giving in on pensions.

Steel corporation heads believe that pensions are not an item for negotiation. At least they have been of that opinion. But they are in for a surprise. Phil Murray thinks that pensions are an important point of discussion—and he aims to make them so, this year. The courts say he is right. The only thing that stands in the union's way is the non-communist

### But Future Uncertainties of Steel Business Will Make Bargaining Difficult

By TOM C. CAMPBELL  
News-Markets Editor

pledge. That hurdle may be covered either by a pledge or a change in the Taft-Hartley law.

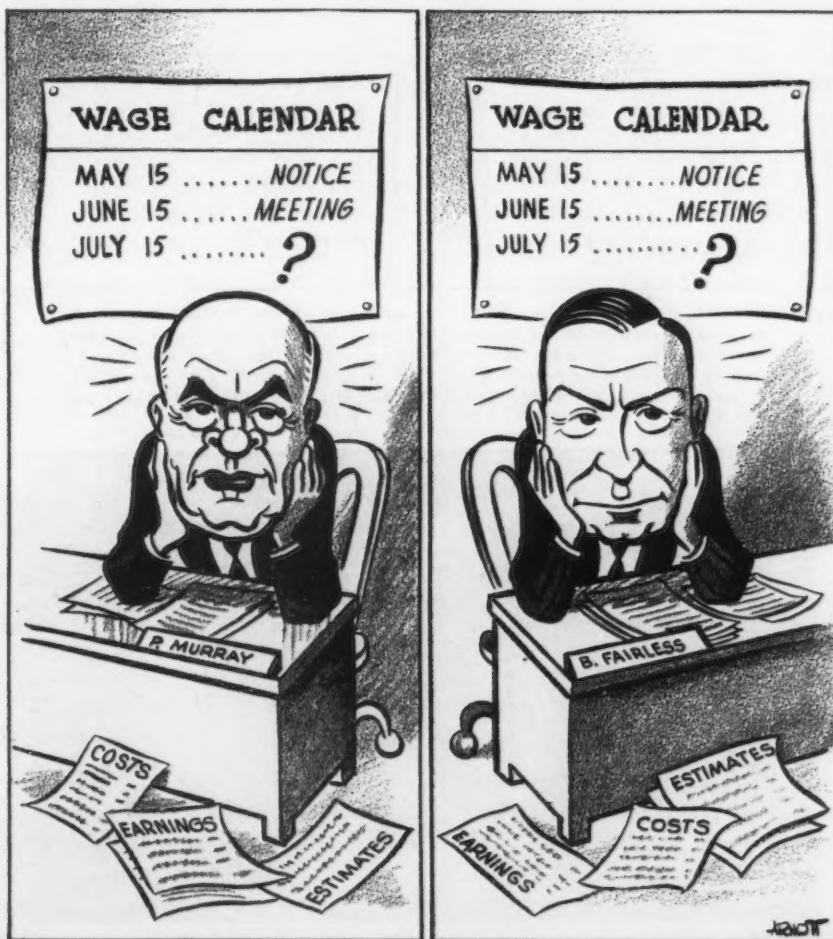
Phil Murray has not made up his mind yet on the wage question. His 200-man policy committee will be meeting soon in Pittsburgh. Then it will be thrashed out. It is clear that the General Motors con-

tract, tying wages to the cost of living, is something a lot of union fellows would just as lief not talk about.

Many think it was a stab in the back; that it prevented a chance for the fourth round. That may be true. And it may be true that the Steelworkers will not push for a cent-per-hour increase. But if they don't they will make up for it in their demands for social benefits. To steelmakers that is just as much a cost item as a wage increase—maybe more so because it keeps going on and on.

It is too early to predict that steelworkers will strike if they don't get what they want this year. But it is not too early to predict that they will come so close to striking it won't be funny. It all depends on the business out-

### The Thinkers!





look—and in the way negotiations progress. It also depends on what Ben Fairless and Phil Murray have to say to each other when they quietly get together in advance of actual negotiations. There has always been a feeling out period before. There will be one this year.

Mr. Murray has a job to do this year. He must get something real good for his men—or make the greatest attempt in years to do so. Last year he was turned down on a wage increase when U. S. Steel cut prices and stood pat on wages. That has now gone down in steel history as a “noble” experiment which failed. Many other steel firms not only refused to raise wages but they either did not cut prices or they did not match U. S. Steel in its cuts. A few did but very few.

Phil Murray did not lose too much face on this move because his contract was for 2 years with a no-strike clause. He could not do anything about it. Later when Ben Fairless found out that it was the wrong time to cut prices and hold wages it was he who took the initiative on the wage increase and price increase. He was the giver and Phil was on the receiving end.

The steel wage increase last year was the first percentage increase since steel firms have had union contracts. In all previous negotiations the raise has been straight cents-per-hour. The per-

centage increase last year was U. S. Steel's idea, not Phil Murray's. His idea has always been to bring the lower paid men closer to the higher paid levels.

Steel firms have good explanations for their high net incomes in 1948. And they will have the same arguments for their first quarter earnings which are sure to be the highest in the postwar period. Higher operating rates, lower scrap costs, lower fuel costs and better efficiency will make new net income record a certainty. But at the same time they will make ammunition for Mr. Murray when he lashes out for social benefits.

This year's wage and social security negotiations will be unique. They will be the most important in the union's 13-year history—because they might be the last to show a real gain for sometime to come. Steel people will argue that net income represents past business and was needed for heavy plant improvements, a better return for stockholders and a fair return on investments in view of inflationary conditions.

The factor which will make steel firms a hard bunch to bargain with is the future uncertainty of steel business. The present operating rates are no criterion of what is to come. The cost of any concession in wages or social security will have to come out of future steel income. What it will be no one can be sure.

There are many steel heads who

think that the ingot rate will slide before the year is out. And there are others who think that “steel will be coming out of the industry's ears” before Christmas. There are still others who think that every steel company will be looking for business by the New Year—or long before.

It all adds up to a tough fight. Mr. Murray is ready for it. So are steel leaders. If an impasse is reached in July there may be a strike. If business slides off fast a strike will only substitute for a lower ingot rate which would come naturally at a later date.

But if business is stronger than most think it will be, a strike would bring back the steel shortage hysteria—and probably government meddling in steel. Yes, it's going to be a rough and ready battle. And it is going to be on Mr. Murray's pet ideas—social security in every way possible for steelworkers.

### International Harvester Sets Up Credit Firm To Aid Its Dealers

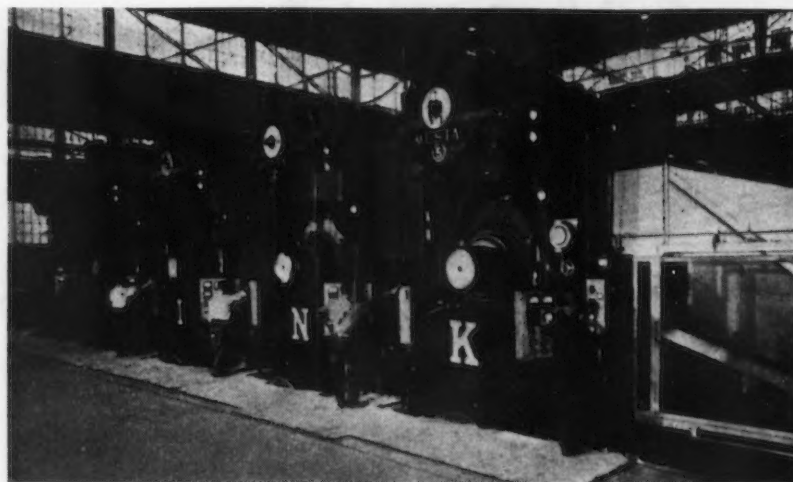
Chicago

••• Better lines of available credit have been established by the International Harvester Co. to its dealers. International Harvester Credit Corp., a wholly owned subsidiary of the Harvester company, will be organized to finance domestic notes receivable for which there is no other source of financing available. In its 1948 annual report, the company announced it was considering such a plan.

An International Harvester spokesman told IRON AGE that the company has no intention of displacing any established credit lines already in existence. Banks and other financial institutions will continue to be principal sources to which Harvester looks for the financing of dealer and customer notes.

The new credit corporation will afford the supplementary financing only in scattered areas around the country where such credit has lately tightened up through the regular channels. Establishment of the new finance company has been approved by Harvester's board of directors and a corporate charter will be applied for shortly.

**FAST MOVE:** When Inland Steel Co. moved its 40-in., 5-stand tandem mill to a new location in the Indiana Harbor Works as part of the company's modernization and improvement program one of the chief considerations was to minimize the resulting interruption in production. The mill is shown in its new spot after being moved and put in operation in less than 9 working days.



## New Seamless Tube Mill Sponsored By Government of Argentina at Campana

### New York

••• A seamless tube mill with an annual rated capacity of 60,000 tons is under construction at Campana, near Buenos Aires, Argentina, as a part of the government-sponsored industrialization of that country. The production is designed primarily to produce seamless pipe for oil casing to replace a part of that previously imported.

The new Argentinian firm which will operate the mill has been incorporated as Societa Argentina Fabricacion Tubes de Acero, but design and construction will be by the Italian firm Techint, which operates in South America.

Mill equipment will include two modified Pilger mills of a new design which uses a special piercing press and are designed to produce 4 in. to 12 in. sizes. Two Dvorak push benches will produce smaller diameters up to 4½ in. Present plans call for the push benches to be in operation in 1950, and the project completed the following year. The 60,000-ton capacity represents the plan for the first construction unit. Further plans have been drawn for an eventual 100,000-ton capacity at some time in the future. It is estimated that the original unit will cost the equivalent of about \$5 to \$6 million in pesos.

Billets for the mill will be imported at least in the first instance, although consideration has been given to a plan for producing them in Argentina.

A matter of particular interest to the South American nation is the fact that the Italian firm, which has contracted to deliver an operating tube mill and keep it running until the Argentinian firm can take over, will be able to build the mill with only a limited draw upon dollar resources.

Techint has been organized in South America as a development company by a group of leading Italian industrialists and technicians since the war. It draws on all the resources of Italian heavy industry for its projects. It has already engaged in a wide variety of industrial construction projects in Argentina and other South Ameri-

can countries. A pipe line project is now half completed, and several power transmission projects are under way. The firm will build a steel fabrication shop in Argentina

## Tool Engineers Cover Details on Developments

### Pittsburgh

••• Tool materials and design for machining and cold forming were the basic discussions at the 17th annual meeting of the American Society of Tool Engineers, held in Pittsburgh on Mar. 10, 11 and 12. Some recent developments in cutting tool and cold forming die designs and materials for working aluminum and high alloy type steels were described, as were design trends of hot forging dies used in upsetting machines.

The Society elected new officers for the coming year at its annual meeting and announced the new roster at the annual dinner, Mar. 12. Robert B. Douglas of Godscroft Industries, Montreal, Quebec, was elected president, succeeding I. F. Holland of Pratt & Whitney. Herbert L. Tigges of Baker Bros., Toledo, Ohio, was elected first vice-president; J. J. DeMuth of Sligo

this year to facilitate construction projects in South America.

The dominant figure in all these operations is Mr. Augustine Rocca, who, as the general manager of Finsider, Italian government lending authority for the steel industry, has played one of the most important roles in the development of the modern Italian steel industry.

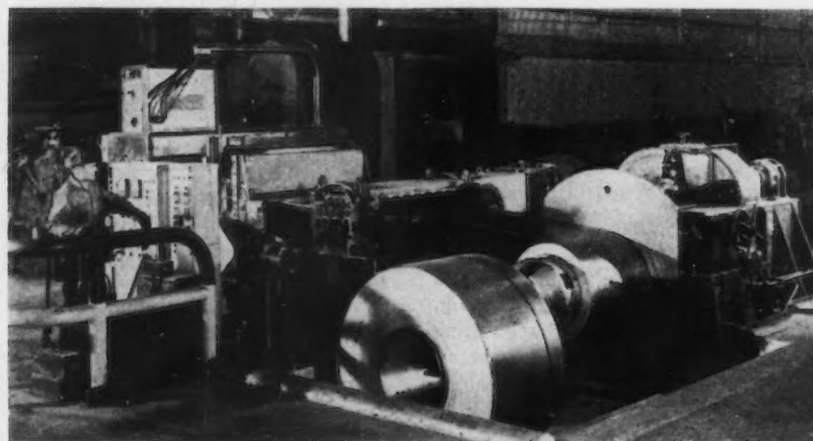
Corp., St. Louis, was elected second vice-president; and Halsey Owen, professor of engineering at Purdue University, was elected third vice-president. George A. Goodwin, Master Electric Co., Dayton, was reelected treasurer and William B. McClellan, Gairing Tool Co., Detroit, was reelected secretary.

L. E. Osborne, senior operating vice-president of Westinghouse Electric Corp., the dinner speaker, spoke on, "Tools—Key to Abundance," stressing industrial productivity and the importance of tools to industry. He pointed out that the average American worker has 7 hp of mechanical energy to help him in his work, and that machines and tools have created rather than destroyed jobs. Today, about 85 pct of all work is done with mechanical energy, but even this is not enough.

Mr. Osborne's one note of fear was the general misunderstanding that has developed from the false idea that more can be had by the individual without his producing more. The desire to get more with-

(CONTINUED ON PAGE 144)

**FEEDER:** William Molik is shown controlling entry of sheet into Carnegie-Illinois' new terne coating line at Gary Sheet and Tin Mill. The 260-ft production line is the first of its kind to employ a new electrolytic pickling bath. Output of this U. S. Steel subsidiary's new line will go to the automotive and agricultural industries.





## Industrial Briefs . . .

• **GAINS FASTENER**—Elastic Stop Nut Corp. of America, Union, N. J., has acquired from the Mid-Continent Metal Products Co., Chicago, all of its patents and other rights to make and sell the Roll-Pin, a pressed-fit fastener.

• **SPREADS ITSELF**—Oil Well Supply Co., Dallas, has established a new district in its eastern division to be known as the Ohio-West Virginia district and comprising the former Ohio and West Virginia-Eastern Kentucky districts. H. C. Wright, Ohio district manager has been named manager of the new district, with headquarters at Charleston, W. Va.

• **MORE ROOM**—Allis-Chalmers Mfg. Co. has purchased from the surplus property disposal center in Wisconsin, the WAA warehouse No. 7 at Carrollville, Wis. A-C paid a little over \$300,000 for this lake front property which will be used temporarily for warehouse purposes and later will be converted to general manufacturing.

• **BIGGER AND BETTER**—Link-Belt Co. has moved its Spokane warehouse and district sales office to larger quarters at North 1303 Washington St. At the new location, the company plans to carry numerous additional items that formerly had to be shipped from the East, San Francisco or Seattle.

• **SALES AGENT**—Williams & Co., Inc., Pittsburgh, has obtained the exclusive sales agency covering western Pennsylvania, Ohio, Kentucky and West Virginia, for clad-metals manufactured by American Clad-metals Co.

• **GOES SOUTH**—Morrison Railway Supply Corp., manufacturing division, Buffalo, has opened a plant in Birmingham. Storage tanks for the gasoline and fuel oil trade are being manufactured at the Birmingham operation.

• **FOUNDRY FLICKERS**—A training film entitled "Molding on a Jolt Roll-Over Pattern Draw Machine" is being offered by the Cooper Alloy Foundry Co., Hillside, N. J., to any engineering school, society or club interested in foundry practices. The 22 min 16mm film will be furnished free on request.

• **HEAD MAN**—Abe Cohen, president Lynchburg Iron & Metal Co., Lynchburg, Va., has been appointed chairman of the finance committee of the Institute of Scrap Iron & Steel Inc. Nathan Winski, Northern Indiana Steel Supply Co., Inc., Michigan City, Ind., has been named vice-chairman of the finance committee.

• **THREE GRADES**—U. S. Products Co., Pittsburgh, has announced the development of three different grades of abrasive compounds specifically for use in grinding and lapping-in brass or bronze tapered plug or key cock valves. Pint samples will be sent upon request.

• **TREKS WESTWARD**—A. Milne & Co., New York, has announced the opening of a sales office and warehouse in San Francisco at 1245 22nd St. R. D. Cortelyou will be the Pacific Coast manager.

• **NEW BUSINESS**—J. J. Crockett, formerly with Republic Steel Corp. in Buffalo and J. G. Green, formerly with United Engineering & Foundry Co. in Youngstown, have organized the Warren Precision Heat Treating Co., 1710 Main St., Warren, Ohio, engaged in commercial heat treating.

• **REPRESENTATIVE**—Marcus Transformer Co., Inc., Hillside, N. J., has announced the appointment of Robert A. Young & Co., Petroleum Bldg., 714 West Olympic Blvd., Los Angeles, as their territorial representative for southern California and Arizona.

## Reports Record Sales

*Cleveland*

• • • **Record peacetime** net sales of \$96,994,774 by Thompson Products, Inc., in 1948 were reported this week by F. C. Crawford, president.

Increased shipments to aircraft customers more than balanced a leveling off of replacement parts sales to automotive wholesalers, he reported.

Consolidated net profit for 1948 was \$4,572,100, equal to 4.7 pct on net sales, and equal to about \$9.57 a common share. This compares with 1947 net of \$4,577,739 or \$9.57 a share.

## National Steel Dividend

*Pittsburgh*

• • • **National Steel Corp.**, at a meeting of the board of directors recently, declared a dividend of \$1.25 per share for the first quarter of 1949, it was announced by Ernest T. Weir, chairman. The dividend is payable Mar. 14, 1949, to stockholders of record Mar. 7, 1949.

## Mullins Earnings Up

*Warren, Ohio*

• • • **Record sales and earnings** in 1948 by Mullins Mfg. Co. were reported by George E. Whitlock, president. Net sales in 1948 were \$47,414,584, compared with \$37,631,055. Net income was \$6,418,222, equal to \$5.07 a common share. The report showed the number of Mullins employees rose to 3900 in 1948, highest in the company's history. The report showed cost of sales \$33,341,064.

## Western Electric Pays

*New York*

• • • **The Western Electric Co.** Board of Directors have declared a dividend of \$1 per share on outstanding capital stock payable on Mar. 31 to stockholders of record Mar. 23.

## National Steel Pays \$1.25

*Pittsburgh*

• • • **National Steel Corp.** has declared a dividend of \$1.25 per share for the first quarter of 1949, it was announced by Ernest T. Weir, chairman. Dividends last year were \$1.00 per quarter.



## Aluminum Consumers Being Offered Larger Tonnages as Market Grows Easier

By JOHN ANTHONY  
Eastern Regional Editor

### New York

••• The aluminum market has eased up considerably in the last month. Consumers of sheet, rod, extrusions and other products are now being offered heavier tonnages. Some consumers who had until recently been unable to find a place on order books are now being courted by more than one producer.

Heavy tonnage jobs are now subject to competitive selling, a sharp contrast to the situation of a month ago. This change in the aluminum market accounts for the eagerness of producers to enter the wire and cable market, for which deliveries had been projected for 1953. The long pent-up demand for power cable is now viewed generally by producers as a means of supplementing the tonnage required by the diminishing sheet market.

Producers have been variously affected by the cancellations of tonnage, with the lightest impact being felt by the producers with the greatest diversification of product. Sheet products have received the heaviest blow because of the contracting market for appliances and housewares. So far, all producers have been able to place cancelled tonnages elsewhere. One is still allocating tonnages, even for May and June shipments. But all producers are reorienting their marketing plans.

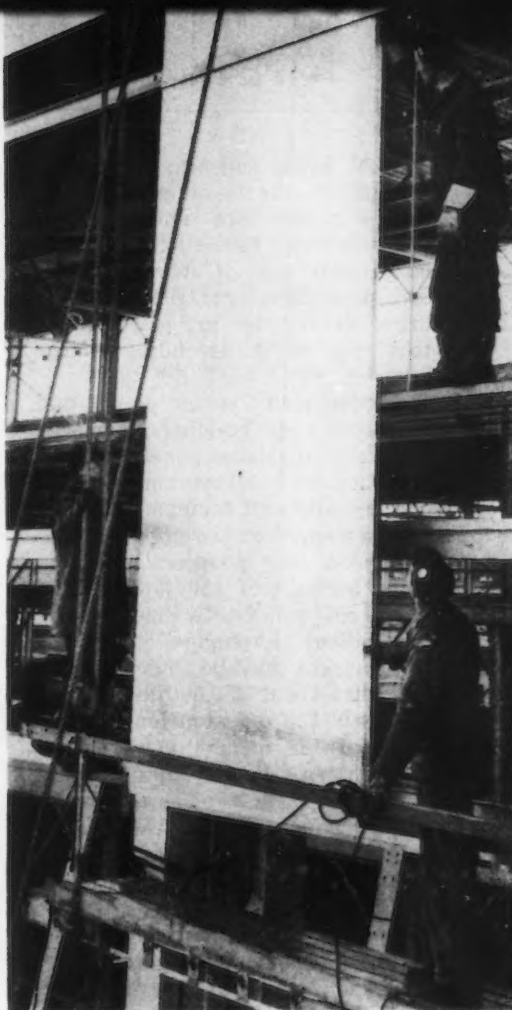
There is some possibility that the market may tighten up again later in the year. Floods are to be expected in the Northwest again this spring and may close down some reduction plants in that area. Any shutdown would be certain to affect the market, particularly in view of recent commitments for wire and cable deliveries.

Finishing facilities for greater product diversification are still being built by producers. Yet reduction capacity limited by available power is inadequate to meet the demands of existent finishing capacity. The war-built ingot plants making use of high cost power have been retired from production. Pow-

er shortages have caused idle potlines at several operating reduction plants.

The only new reduction capacity on the horizon is the Aluminum Co. of America plant now being built at Point Comfort, Tex. But this plant may not go into production for another year. Using natural gas for power development, this plant was planned for two potlines, minimum operation producing 35,000 tons a year. Additional gas supply may permit the operation of a third potline raising ingot production to 57,000 tons a year. In a month, Reynolds Metals Co. expects to bring into production its third potline at Jones Mills, Ark., with power made available by its entry into the wire and cable market.

Producers felt the first impact of cancellations about the time that it was made public that the 70-group airforce had been doomed by administrative decision. There had apparently been some ordering ahead to protect commercial requirements which was no longer deemed necessary when airforce procurement objectives were set at a more modest level. Also the reduced inventory policy now being generally applied by industry has been a factor. The higher water levels of the early months of the



**EASY DOES IT:** Workmen are shown installing aluminum insulated panels as part of the side wall construction on Davenport sheet plate mill. About 294,000 sq ft of panels were needed for the job. Panels are 12 ft high.

year cancelled out the probability of additional power losses, and also permitted some increase in ingot production.

Ever since the end of the war the building market has constituted a heavy tonnage consumer for aluminum products. But producers have been unable to cultivate it properly because of the shortage of metal. The field is comprised of two major elements, insulated panels for industrial plant construction, and corrugated roofing and siding sheet for the farm market. All producers are now ready to cultivate the industrial corrugated sheet market on a very substantial basis.

There are at present two producers of insulated panels for industrial use, H. H. Robertson Co., Ambbridge, Pa., and Detroit Steel Products Co., Detroit. Both companies produce insulated panels for plant walls using aluminum or steel sheet

### Aluminum Insulated Panel Construction Jobs

Commonwealth Edison Co., Stickney, Ill.  
Ohio Public Service Co., Lorain, Ohio  
Toledo Edison Co., Toledo, Ohio  
Ottetail Power Co., Ortonville, Minn.  
Manilla Electric Co., Manilla, Pa.  
Metropolitan Edison Co., Reading, Pa.  
Endicott Johnson Co., Binghamton, N. Y.  
American Enka Co., Knoxville, Tenn.  
L. Bamberger & Co., Bloomfield, N. J.  
Dayton Power & Light Co., Dayton, Ohio  
Federal Telecommunications Laboratories, Nutley, N. J.  
Country Life Press, Garden City, N. Y.  
Aluminum Co. of America, Davenport, Ia.

on both sides, and also a half and half panel with the aluminum sheet on the outside face. The high cost of masonry construction today makes this type of sidewall structure quite economical. Estimates for brick construction are placed at \$3 to \$5 per cu ft, depending on the location.

A good many power plants and industrial plant buildings have been built with insulated panel wall construction with aluminum used for one or both wall facings. The fabricators say that the use of aluminum for this purpose will continue because of the low maintenance cost relative to that of steel. The potential tonnage offered by this market may be gaged by the fact that about 220,000 lb of sheet and 30,000 lb of extrusions will be required for a new power plant in eastern Pennsylvania using aluminum on both sides of the insulated panels. The market should continue as long as masonry costs remain high.

Aluminum producers are also stepping up their activity in the farm and home corrugated sheet market. The use of aluminum for roofing and siding has grown to heavy proportions since the end of the war principally because of the long term shortage of galvanized steel. Wholesalers in the South who cater to this market have had to depend almost exclusively on aluminum to meet the demand. But they say that when steel becomes freely available to them, an estimated 20 to 35 pct of the business

will be retained by aluminum. This is principally due to its insulating value and low upkeep cost.

At present the price of aluminum roofing sheet is very little higher than galvanized steel. Aluminum in 0.019-in. gage is delivered to dealers at \$9.50 to \$9.85 per square, compared with 29 gage galvanized at \$6.50 to \$9.00 in the Southeast depending on the producing point.

### Form British Grinder Firm

Pittsburgh

••• A new company has been formed in England to develop some of the foreign market for sheet and strip grinders. As in this country, customers are demanding superior finishes, particularly on stainless and nonferrous sheet and strip.

The new firm, Hamilton Surface Grinders, Ltd., P. O. Box 77, Sheffield, England, has acquired patents, sales and manufacturing rights for the grinding and finishing machines produced here by Hamilton Pump Co. The contract covers sales in the British Isles, Europe, India, Pakistan, Australia and South Africa.

Officials of the English company indicated that they are experienced in the operation of the Hamilton machines. Three units are now being used by Arthur Lee & Sons, Ltd., Sheffield, grinding stainless strip up to 24 in. wide. Hamilton Surface Grinders, Ltd., will produce the machine for 8, 24 and 42-in. strip.

### Urges Export of U.S. Metallurgical Coal to Marshall Plan Nations

Washington

••• A demand is being made that the Economic Cooperation Administration permit larger shipments of American high-grade metallurgical coal to Marshall Plan countries.

Poor quality European coal is holding up foreign industrial recovery while the United States is producing more high quality metallurgical coal than is needed by domestic consumers, according to John S. Routh, head of the Coal Exporters Association.

He pointed out that Belgian, Dutch, French and other continental industries were built up on coking coal supplied largely by Britain and Germany. At present, England can ship but little high grade and Germany practically none.

Returning from abroad where he visited the industrial centers of various Marshall Plan nations, Routh declared that American mines and exporters were the only sources for the high quality coals needed.

"For the first time since the beginning of the war," he said, "the highest types of American metallurgical coals are in surplus and available for export. American producers and exporters are anxious to fulfill European requirements if permitted to do so by a revision of the ECA allocation system."

### McKee Co. Dividend

Cleveland

••• Directors of Arthur G. McKee & Co. have declared a dividend of 75¢ per share on the Class B stock of the company. The dividend is payable Apr. 1 to stock of record Mar. 21. It will be the second 75¢ dividend paid this year. The next meeting of the directors for consideration of dividend payments will be held early in June.

The company reports that it is continuing to make good progress on the large amount of work in process the company has on hand. Also, that the dollar volume of new work taken to date in 1949 is greater than for the same period in 1948.



**SWITCHERS:** This is an interior view of plant No. 3 of Electromotive Div. of General Motors Corp. located on Clinton Road, Cleveland. Plant now produces all switching locomotives for GM. Plans for doubling present production by midsummer have been made, according to C. R. Osborn, vice president.



## French Study Plans For Iron and Steel Plant in Indo China

Paris

••• Plans for development of an iron and steel industry in Indo China are being studied by the French Plans Commission. Its latest report points out that iron ore fields are known in various regions, including the Yvonand mine with reserves estimated at 15 million metric tons. The report says 300,000 to 400,000 tons annually could be taken out without great expense.

Only coking coal mine is at Phan-Me. But reserves of anthracite are plentiful. Research presently underway will determine whether this can be used. If not, electric blast furnaces, such as those used in Italy, Japan and the Scandinavian countries, may be sought.

The steelworks plan includes two blast furnaces of 140 tons capacity daily, three 10-ton bessemer converters, and an oil-fired 20-ton openhearth furnace. Eventually one electric furnace could replace the openhearth if fuel oil supply were a problem.

Total output for both domestic use and export would be 100,000 tons of pig iron and 60,000 tons of finished products.

## Zinc Shortage Hurting

Paris

••• Reduction of credits in dollars for zinc purchases is causing a serious problem for French galvanizers. Six of 13 plants have closed because of the cut in zinc allocations during the first quarter.

Other French companies report supplies of tin and copper are inadequate, and that this is causing them the most difficulty in attempting to increase output.

## U.S. Helps Boost Output

Vienna

••• Following the receipt of new machinery from the United States three Austrian plants producing cutlery have succeeded in raising their capacity by 100-250 pct in one year. Yearly exports now amount to about \$800,000. Main markets are Turkey, Greece, Yugo-

slavia, Western Europe and Scandinavia. Stainless sets and blades are also exported to South America. Stainless steel plates are exported to Egypt and Iran. Delivery terms are 6 months or more.

## German Steel Output Up

Frankfurt

••• German Bizone steel output was at a new postwar high during February. Output of steel ingots was 662,247 tons, a gain of 11,000 tons over January, the previous record month.

However, biggest gain was recorded in hot rolled products. February output was 454,530 tons, more than 16,000 tons above January.

Pig iron production amounted to 525,319 tons in February. This was 19,000 tons less than January, but more than double the output for February 1948.

## First British Helicopter

London

••• The British Navy will shortly receive its first British-built helicopter—a Westland Sikorsky S-51. More will follow. Other S-51s will go to Pest Control, Ltd., one of several commercial companies interested in this helicopter.

Both the Navy and Pest Control have had extensive experience with American-built S-51s. So has the helicopter unit of British European Airways Corp.

Principal difference between

British and American versions is the engine, although minor changes had to be made in order to convert American engineering practice into English. Engine chosen for the British version is the Alvis Leonides, an air-cooled radial of 525 hp. It replaces the 450 hp American Wasp Junior.

## French Price Index Down

Paris

••• Recent price trends in France have been similar to those in the United States. For three consecutive months wholesale prices have been on the decline. This is considered one of the most encouraging signs of a return to a sounder economy.

Decreases have been: 1.5 pct in January, and 2.4 pct in February. This movement has been almost solely due to the fall of farm and food products—10.8 pct in 3 months. Industrial products have remained stationary, but semi-manufactured goods show a small increase.

## Free Market Prices Fall

Brussels

••• Although potential needs of many importers are still high, there is strong evidence of a return of competition in the international market. Traders here expect increasing difficulties in selling iron and steel products at prices which could be obtained until now on the so-called "free market."

## Coming Events

Apr. 4-6	American Gas Assn., distribution, motor vehicle and corrosion conference, Cincinnati.
Apr. 5-6	Metal Powder Assn., annual meeting, Chicago.
Apr. 8-9	Lead Industries Assn., annual meeting, Chicago.
Apr. 11-12	American Machine Tool Distributors' Assn., spring meeting, Savannah, Ga.
Apr. 11-12	American Zinc Institute, annual meeting, St. Louis.
Apr. 11-14	National Assn. of Corrosion Engineers, annual conference and exhibition, Cincinnati.
Apr. 11-15	Western Metal Congress and Exposition, Los Angeles.
Apr. 18-20	Midwest Power Conference, Chicago.
Apr. 18-20	American Institute of Mining & Metallurgical Engineers, annual conference of Openhearth Steel Committee, Chicago.
Apr. 19-20	Magnesium Assn., annual meeting, Chicago.
May 2-3	Assn. of Iron & Steel Engineers, annual conference, Baltimore.
May 2-5	American Foundrymen's Society, annual convention, St. Louis.
May 4-7	Electrochemical Society, semiannual meeting, Philadelphia.



## Strong Fight Looms on Controversial Belt Conveyor System from Erie to Ohio

### Cleveland

• • • While major opponents continued to quietly marshal their forces, Riverlake Belt Conveyor Lines, Inc., the 130-mile \$210,000,000 overland belt conveyor transportation system between Lake Erie and the Ohio River, met an outspoken and unexpected foe and gained a powerful ally.

Riverlake's new foe was Cleveland's mayor, Thomas A. Burke, who announced that he would actively oppose the project because "it would seriously jeopardize Cleveland's front ranking position as the largest and most important shipping port for ore and coal.

"It would make Cleveland a prairie and Ashtabula, Ohio, a desert," the mayor declared.

"I wouldn't be so much opposed to it if it were going to be operated on a common carrier basis where it would carry any kind of freight, but the operators want to use it as a contract carrier."

Riverlake's ally was C. M. White, president, Republic Steel Corp., and first of the major industrialists in the area which Riverlake will serve to make a public statement either for or against the project.

Mr. White issued the following statement:

"From the information on hand,

the proposed belt conveyor connecting the Ohio River with the Great Lakes appears to be a sound engineering plan. If put into operation by private capital, it will largely answer the demand for the canal from the Lakes to the Ohio River and would permit this enormous operation to be undertaken by private capital instead of with taxpayers money.

"The steel industry of northeastern Ohio needs either a canal or a conveyor system to compete with steel producers who are more favorably situated due to improvements undertaken by the government on the Allegheny, Monongahela and Ohio rivers. In my opinion, the proposed conveyor should be given a great deal of consideration and study. If such study supports the claims of those proposing the idea, then I believe it should have the backing of everyone who wants to see the standard of living of our country continue to improve.

"Either the canal or the conveyor will hurt some railroads temporarily, but it has been the experience of this country that each new advancement in science or industry ultimately reacts to the overall good. We have to take the bad with the good. If steel and other commodities can be reduced in cost and

price, more such products will undoubtedly be produced and everyone, including the railroads, will benefit by the increase in the overall production which would result.

"I find it hard to believe that any such proposal would act to the detriment of the city of Cleveland."

Major opposition to Riverlake Belt Conveyor Lines, Inc., will probably develop publicly within the next 2 weeks when the Senate Judiciary Committee considers the bill to authorize its construction.

Another question, certain to bring the battle out in the open, is whether Riverlake should be granted common carrier rights by the legislature.

Arguments are being advanced by both sides, generally along the following lines:

Those in favor of the conveyor belt point out that the saving to the Cleveland steel industry would be about \$3 a ton or more on finished steel, assuming 3 tons of coal to each ton of steel produced. This would improve the competitive position of Cleveland producers.

This argument is based on the assumption that Riverlake can reduce freight charges of industrial coal consumed in Cleveland by \$1 a ton or more. H. B. Stewart, Riverlake president, has stated that the belt will bring coal from the Ohio River to Cleveland for 79¢ to \$1.23 a ton, depending on the tonnage moved, compared with present rates of about \$2.29 a ton on coal unloaded from river barges and \$2.64 a ton on all-rail coal from Ohio mines.

Some believe such savings in coal freight charges would mean an increase in steelmaking capacity in Cleveland and reductions in prices to steel consumers in this area.

Those opposing the conveyor belt allege that its function will not be that of a common carrier because of a section in the bill providing for contracts to be made with large shippers for the handling of their freight.

It is also pointed out that Riverlake will eliminate coal dock and part of the ore dock operations and result in unemployment. It will also mean layoffs in train crews in the coal and ore traffic and freight rates might have to be increased to make up the deficit.

Opponents also point out that a conveyor belt would be so rigid in operation that the coal and ore

**AWARD:** The George Gorton Machine Co., Racine, Wis., recently was selected for the Award of the Labor Relations Institute of New York for "outstanding achievement in industrial relations." George Gorton III, Executive vice-president and general manager, and Carl Wohlin, union committee chairman, accepted the plaque from Ola C. Cool, director of the Institute.



shipping trade would have to have some other kind of cushion or reserve than that provided by the 35,000 cars employed in the traffic.

Substitution of stockpiles for reserves or cushions would result in higher costs than are figured in the estimates and in the case of coal would lead to its degradation. Unless special provisions were made, lump coal would deteriorate during the belt movement.

Another question raised is how the conveyor belt can keep separate the numerous grades of iron ore and coal during shipment and direct them to their proper consumers.

## Canadian Vessels to Help Ore Shipments

Washington

••• Canadian ore vessels will assist in the shipment of iron ore between United States ports on the Great Lakes again this year.

Congress, in enacting legislation authorizing ore shipments in Canadian vessels during the 1949 shipping season, estimated that about 40 ore vessels of Canadian registry would be required to assist United States vessels in moving a total of about 83 million gross tons of ore.

"The American fleet alone is not able to move this great tonnage of Lake Superior ore and will require the assistance of the Canadian vessels to haul this very large tonnage," Representative Hart, D., N. J., declared during House debate on the bill.

A 1920 law requires the use of United States vessels for commodities moving between United States ports on the Great Lakes. The new law continues a wartime suspension of the earlier statute.

## Sales Hit All-Time High

Cleveland

••• Production, sales, payrolls and profits of Lamson & Sessions Co. reached all-time record high during 1948, Roy H. Smith, president, reported this week. Earnings rose to \$1,855,777, equal to \$5.86 a share, compared with \$1,490,852 or \$5.13 during 1947. Sales in 1948 totaled \$23,309,481, compared with \$19,923,983 for 1947. Mr. Smith said the company's backlog of orders is not as large as it was a year ago, but is "a satisfactory volume."

## Sets European Steel Target; Urges Scrap Collection, Use of Leaner Ores

Geneva

••• Members of the Steel Committee of the United Nations' Economic Commission for Europe have agreed upon national and international measures to further increase European steel production. The target for 1949 is an European crude steel output of 56 million tons, excluding USSR. This would be 9 million tons above the 1948 level, 20 million tons over 1947, and equal to 1937's record output.

Sixteen European countries and the United States took part in the 3-day session which dealt with problems of filling needs for coke, scrap and ores for steel making. The committee agreed to maintain the principle of the existing "ECE steel formula" for recommendation of allocations of metallurgical fuels during the remainder of 1949.

The committee noted a big improvement in coke supplies over a year ago, when considerable blast furnace capacity was idle for want of this material. With good future prospects for coke supplies, the committee is seeking an improvement in scrap and rich iron ore position (1) through a decrease in consumption because of better availability of coke and (2) through raising the supply of scrap and ore.

An appeal for more intensive

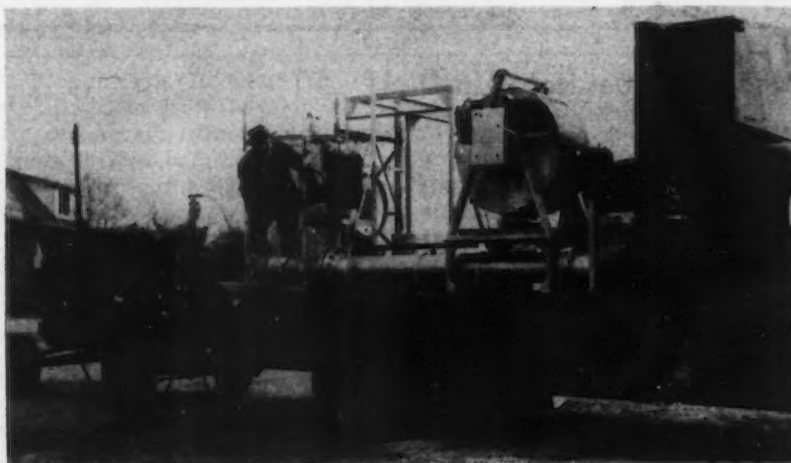
scrap collection in Europe followed a recognition by the delegations that the scrap position in 1949 would still be difficult in certain countries. A report submitted by the Panel on Scrap pointed out that special measures taken for scrap collection by England, Switzerland and the U. S. had achieved good results. In Britain it is generally agreed that about a million tons of extra scrap was recuperated in the scrap drive of the past year.

During the postwar years supplies of rich ore have been unbalanced by the heavy drain resulting from the coke shortage. The reduced number and unfavorable state of repair of blast furnaces makes it difficult to reduce the consumption of scrap and rich ores.

While little improvement in ore supplies is expected in 1949, a significant relieving of the shortage is expected in 1950. The committee estimates that the deficit of rich ore in Europe this year will be 3.2 million tons, or 14 pct of its import requirements.

It was agreed that in spite of difficulties explained at the meeting the countries producing rich and lean iron ores should do everything in their power to increase export availability of both ores.

**TESTER:** Although this looks like a cement mixer, it is really a mobile laboratory, sponsored by American Iron and Steel Institute and American Coke and Coal Chemicals Institute. It is touring the nation, testing coke produced at iron and steel plants. It stays at each plant about 2 weeks. Aim is improvement of fuel quality.





## AMERICAN IRON AND STEEL INSTITUTE

## Production of Open Hearth, Bessemer and Electric Steel Ingots and Steel for Castings

## YEAR 1949

(Preliminary)

Period	OPEN HEARTH		BESSEMER		ELECTRIC		TOTAL		Calculated weekly production (Net tons)	Number of weeks in month
	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity		
* January.....	7,287,683	101.1	408,552	92.6	487,260	93.8	8,183,495	100.2	1,847,290	4.43
† February.....	6,627,079	101.8	379,698	95.3	457,151	97.5	7,463,928	101.2	1,865,982	4.00
March.....										4.43
1st Quarter.....										12.86
April.....										

† Preliminary figures, subject to revision.

\* Revised.

## YEAR 1948

Period	OPEN HEARTH		BESSEMER		ELECTRIC		TOTAL		Calculated weekly production (Net tons)	Number of weeks in month
	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity		
January.....	6,768,497	95.5	343,169	77.5	361,110	79.0	7,472,776	93.6	1,686,857	4.43
February.....	6,245,338	94.3	340,596	82.3	354,270	82.9	6,940,204	93.0	1,676,378	4.14
March.....	6,841,578	96.6	363,235	82.0	403,322	88.2	7,608,135	95.3	1,717,412	4.43
1st Quarter.....	19,855,413	95.5	1,047,000	80.6	1,118,702	83.4	22,021,115	94.0	1,693,932	13.00
April.....	5,640,168	82.2	185,089	43.2	392,900	88.7	6,218,157	80.4	1,449,454	4.29
May.....	6,799,289	96.0	355,562	80.3	416,801	91.1	7,571,652	94.8	1,709,177	4.43
June.....	6,481,879	94.5	356,810	83.2	417,665	94.3	7,256,354	93.8	1,691,458	4.29
2nd Quarter.....	18,921,336	90.9	897,461	69.0	1,227,366	91.4	21,046,163	89.7	1,617,691	13.01
1st 6 Months.....	38,776,749	93.2	1,944,461	74.8	2,346,068	87.4	43,067,278	91.9	1,655,797	26.01
July.....	6,346,423	89.8	324,991	73.6	395,610	86.7	7,067,024	88.7	1,598,874	4.42
August.....	6,631,157	93.6	371,205	83.8	435,246	95.2	7,437,608	93.1	1,678,918	4.43
September.....	6,592,226	96.3	387,153	90.5	436,231	98.7	7,415,610	96.1	1,732,619	4.28
3rd Quarter.....	19,569,806	93.2	1,083,349	82.5	1,267,087	93.5	21,920,242	92.6	1,669,478	13.13
9 Months.....	58,346,555	93.2	3,027,810	77.4	3,613,155	89.4	64,987,520	92.1	1,660,386	39.14
October.....	7,118,299	100.5	409,545	92.5	459,268	100.4	7,987,112	100.0	1,802,960	4.43
November.....	6,922,656	100.9	411,049	95.9	454,217	102.6	7,787,922	100.7	1,815,366	4.29
December.....	6,925,300	98.0	393,609	89.1	452,266	99.1	7,771,175	97.5	1,758,184	4.42
4th Quarter.....	20,966,255	99.8	1,214,203	92.4	1,365,751	100.7	23,546,209	99.4	1,791,949	13.14
2nd 6 months.....	40,536,061	96.5	2,297,552	87.5	2,632,838	97.1	45,466,451	96.0	1,730,737	26.27
Total.....	79,312,810	94.9	4,242,013	81.2	4,978,906	92.3	88,533,729	94.0	1,693,453	52.28

Note—The percentages of capacity operated are calculated on weekly capacities of 1,599,286 net tons open hearth, 99,962 net tons Bessemer and 103,228 net tons electric ingots and steel for castings, total 1,802,476 net tons; based on annual capacities as of January 1, 1948 as follows: Open hearth 83,610,690 net tons, Bessemer 5,226,000 net tons, Electric 5,396,770 net tons, total 94,233,460 net tons.

## Canada's Steel Rate Up

Toronto

... Canadian production of steel ingots and castings for January 1949, totaled 284,707 net tons which was a daily average rate of 88.4 pct of total rated capacity. This compares with 280,425 tons in December, when the average was 87 pct, and with 256,726 tons or daily rate of 85.2 pct for January 1948. Total annual rated capacity was 3,547,000 net tons in January 1948 and is now 3,792,000 tons a year.

January production included

275,987 tons of steel ingots and 8720 tons of steel castings. During that month charges to steel furnaces included 156,103 tons of pig iron; 80,684 tons of scrap of consumers' own make and 81,378 tons of purchased scrap.

## Prices Increased 10 Pct

London

... Only 5 months after they were put on the market prices of the three new Morris car models have been raised by nearly 10 pct. The makers blame the increased cost of materials.

## To Head ISIS Committee

Washington

... Walter I. Bregman, Price Iron & Steel Co., Chicago, has been reappointed chairman of the brokers committee of the Institute of Scrap Iron & Steel, Inc., by Edward L. Solomon, of Pittsburgh, who is president.

Samuel A. Nathanson, M. Cohen & Sons Co., Cleveland, has been named vice-chairman of the committee.

One of the objectives of the brokers committee in 1949 will be to broaden brokers' services.



## Natural Gas Industry Seeks Signs of Break in Steel Demand

### Washington

•••The natural gas industry, hanging on the ropes as it gasps for steel pipe, is hopefully watching the straws in the wind for indications of breaks in steel demand which might ease its own position.

It needs 1.9 million tons to complete pipeline construction already started or authorized. If all applications now before the Federal Power Commission were to be approved, another 4.9 million tons would be required.

Needs of the gas and oil industries cannot very well be separated. And there are signs of an easing up of the oil industry's position within the next few months (THE IRON AGE, Feb. 3, 1949, p. 155). This tends to make the overall line pipe picture somewhat brighter.

But present indications are that if projected expansion plans of the natural gas industry are carried out, it alone could absorb the entire line pipe output for considerable time to come.

Last year, the production was something like 2,221,000 tons. The Office of Industry Cooperation, now conducting a special study of tubular goods, estimates that 1949 production may go as high as 2,675,000 tons. This is assuming that there are no serious interruptions to either production or construction of new pipe-making capacity.

This tonnage estimate is slightly more than would be required to complete gas line projects already approved by the FPC. But it does not take into account applications now pending before the FPC for the laying of 17,000 miles of additional lines.

Basically, increased postwar demand is at the root of the present demand backlog. To this is added the fact that during the first 18 months of the war, only 71 miles of new pipeline were authorized. To the postwar demand was added the hang-over of the 3500 miles of lines authorized during the final two war years.

Steel has been the bottleneck to the unprecedented expansion program since 1945. But postwar

### Applications Before FPC For Approval Set Total Needs At 4.9 Million Tons

o o o

By KARL RANNELLS  
Washington Bureau

o o o

steel demand also zoomed past industry capacity and total production had to be parceled out among the many historical users on a quota basis.

Also, the steel industry was scarcely prepared to meet the big postwar demand for pipe with diameters of 20 in. or more. Pre-war trunkline pipe production had been in the smaller sizes and had averaged about 260,000 tons annually—of which the gas industry took about 50,000 tons.

Theoretically, the natural gas industry would be entitled to only about 20 pct of postwar production. Actually, it has fared much better. But it has had to do some fast and fancy stepping in order to keep construction operations

going. Plans were reshuffled—sometimes substituting one size pipe for another, many times having to engage in conversion and gray market deals.

Both the latter type of operations meant lost time and added costs. Gray market prices were as much as three times the industry's quoted price. Switching sizes often threw an additional tonnage drain on the overloaded steel demand.

For instance, in order to be able to meet its contracts in constructing a 1200-mile line, one company had to go back to FPC for permission to substitute on part of the line considerable mileage of 30-in. pipe which it could get for the planned 26-in. which it couldn't. Another company was forced to lay parallel lines of 16-in. and 20-in. pipe when it could not get delivery on 26-in. This added a minimum of 50,000 tons more steel than had been calculated.

All things considered, however, the natural gas industry has not fared too badly. From July 1945 through August 1948, it had built and placed in operation some 5200 miles of pipeline, requiring more than 1 million tons of steel. This represents an average of about 334,000 tons of pipe a year or an amount equal to the prewar production of the larger sizes.

As to the present situation, according to the FPC's latest survey (September), there were then 89 major projects still under construction which involved a total of 2,185,000 tons of line pipe. Of this amount, about 821,000 tons had been delivered as of September 1. An additional 238,000 tons were scheduled for delivery before the end of last year. Still another 517,000 tons had definitely been promised for delivery during 1949, while about 444,000 tons had been lined up for delivery in 1950.

Although this pretty well knocked out the overall deficit, some companies were still finding the going tough. At the time of the FPC survey, one company alone was trying to place orders for 80,000 tons in order to complete one of its projects. Others

### Good Customers

#### Washington

•••The natural gas industry will be one of the steel industry's best customers for the next several years, it is indicated by a survey just completed by the National Security Resources Board.

Increasing demands for gas, estimates the NSRB, will boost sales by at least 50 pct over the 5-year period from 1947 through 1952. Consumption was 3.1 billion cu ft in 1947. It is forecast at 4.6 billion cu ft by the end of 1952.

Furthermore, the Board says, sales would greatly exceed these figures if steel pipeline requirements could be met and if the cost ratio of gas to other fuels does not change too much.

The NSRB estimated that were steel available, the gas industry could absorb 4 million tons of pipe during the 12-month period ending next June. But, the Board finds, there is a lag in delivery schedules ranging from 2 to 40 months.

# POSTWAR MAJOR NATURAL GAS PIPELINE PROJECT APPLICATIONS FILED WITH THE FEDERAL POWER COMMISSION

(July 1, 1945 - Dec. 31, 1948)

	Miles	Estimated Tonnage
Total Applications, Authorized and Pending, as of Jan. 1, 1949	35,800	8,800,000
Projects Authorized, July 1, 1945, through Dec. 31, 1948	18,900	3,900,000
Applications Pending before FPC, as of Jan. 1, 1949	16,900	4,900,000
Lines Completed through Sept. 15	5,200	1,425,000
Probable Pipe Shipments, Sept.-Dec.		275,000
Estimated Pipe Needs to Finish Authorized Projects, Jan.		2,200,000
Estimated Potential Demand, Less Probable Accepted Orders		5,500,000

Compiled by THE IRON AGE from data supplied by the Federal Power Commission and the Independent Natural Gas Assn.

were trying desperately to obtain acceptance of smaller orders.

Since the survey and until the first of this year, the FPC has given approval to varied projects totaling about 3500 additional miles of pipeline and loops. These will require another 600,000 tons or so of pipe.

Moreover, new applications have been flowing in. During the same four-month period, new applications involved an additional 5800 miles and a probable 1.3 million tons of steel. Nearly 2900 miles of these pending projects called for the scarce 26-in. pipe.

The Independent Natural Gas Association generally takes a grim view of its position. Spokesmen point out that at the beginning of the last quarter 1948 its foreseeable steel requirements for pipe amounted to about 3.7 million tons with 2,000,000 or less in sight.

"The demand today is far in excess of the steel industry's ability to produce our present annual requirements," one gas industry official said recently. "Sometimes I question whether we shall ever be able to meet demand."

All of this indicates that users of line pipe will be good customers for steel for considerable time to come. But the picture may not be as gloomy as it currently appears to the gas industry. While it certainly will be many months before all buyers of pipe will be able to get it when they want it, it is also probable that the overall picture will have completely changed by the end of the year.

Results of the steel industry's postwar expansion is becoming evident to pipe buyers. For example, a new Republic mill at Gadsen went into production last year and can currently turn out 100,000 tons annually on a 3-shift

basis. Also, a new Kaiser mill will be completed at Fontana this year. It also will have a capacity of 100,000 tons.

These are but straws in the wind—but when straws keep piling up, they always make a fork-full.

## Koppers Introduces A Piston Ring for Cars

Pittsburgh

••• A new top compression piston ring for passenger cars now being produced by the Piston Ring Dept., Koppers Co., Inc. is claimed to be twice as strong and 50 pct springier than any on the market. The ring is made of a centrifugally cast alloy, called K-Spun. The ring has a tensile strength of 75,000 psi (min), elastic modulus of 18,000,000 (min) and a hardness of 95 to 105 Rb.

Dr. Tracy Jarrett, manager of engineering and research for the piston ring department of Koppers said that K-Spun alloy is the result of 3 years of development work. He pointed out that the spinning process also adds to ring strength by creating a new structure in the metal.

## Construction Awards Up

Boston

••• Construction contracts awarded in New England for the first 2 months of this year totaled \$54,359,000—an 8 pct increase over the corresponding period a year ago, according to James A. Harding, district manager of the F. W. Dodge Corp.

He said the sharpest increase was in heavy engineering works. Residential awards were \$7,667,000 last month—off 36 pct from January but 52 pct higher than the same month a year ago.

## February Steel Output Sets New Weekly Record

New York

••• Average weekly production of steel in February was higher than ever before, at 1,865,982 net tons, according to American Iron and Steel Institute. The month's output at 7,463,928 tons of ingots and steel for castings was greater than in any previous February.

Production in the first 2 months of 1949 was 15,647,423 tons, an increase of more than 1,234,000 tons, or 8 pct, over the corresponding period in 1948.

The operating rate for February at 101.2 pct of capacity tied the record of October, 1943. January output was 100.2 pct.

All three types of furnaces, open hearth, bessemer and electric, participated in the increase in production over a year ago, the gain in electrics being about 32 pct, far outstripping the others.

## Johnson Urges Moratorium

Washington

••• Passage of legislation declaring a moratorium on delivered price suits is now "the best procedural answer," the Senate is told. Chairman Johnson, D., Colo., of the Senate Commerce Committee, says in a report covering the past year's activities of the Trade Policies Subcommittee that he is still interested in a law to legalize delivered prices but a moratorium bill is more important at this time. The Rigid Conduit Case, now pending in the Supreme Court, will provide an opportunity for the court to eliminate "the troublesome confusion caused by the dicta in the Cement Institute Case and clarify the law as to the right of individual freight absorption," he points out.

## PA's Visit Power Plant

St. Louis

••• Members of the Purchasing Agents' Assn. of St. Louis visited the Venice, Ill., power plant of the Union Electric Co. Mar 15. This is the second plant visit made by the association during the current season, the first being made to the Wagner Electric Corp. plant.



## Republic Steel Buys Into Liberia Mining Co. on Iron Ore Deal

### Cleveland

• • • **Liberian iron ore** (THE IRON AGE, Feb. 24 p. 143) was as good as in U. S. furnaces this week as a result of a shrewd move by Republic Steel Corp., which purchased a stock interest in the Liberia Mining Co., Ltd., a corporation of Liberia, West Africa, which has a concession about 45 miles northeast of the seaport capital, Monrovia.

The concession contains an extensive deposit of high grade iron ore available at ground level. The ore is a mixture of hematite and magnetite, assaying 68 pct in iron and low in phosphorous, sulfur and silica. Average analysis of Lake Superior ore is about 51 pct iron. Pure magnetite is 72.4 pct and pure hematite is 70 pct iron.

The ore is found in hard masses which may be crushed into lumps suitable for openhearth charge and feed ore. Iron ore is used in openhearth furnaces to speed up reduction of the carbon during the steel-making operation.

Development to date has been confined to a limited area which is known as the "Bomi Hills" iron ore deposit. This deposit has a cliff-like exposure of a mile or more extending above the surface from 30 ft to 100 ft.

**Extensive diamond drilling** and surface exploration has revealed a substantial tonnage of this high grade ore. Until such time as additional diamond drill work has been completed, it is impossible to estimate with any great accuracy the expected tonnages which the deposit will yield.

Heavy expenditures will be required to bring this deposit into production, in addition to the cost of a railroad, now under construction, 45 miles in length, from Bomi Hills to the port of Monrovia.

Terminals of the railroad, equipped to handle a million tons of ore a year, will be completed this October but the line itself will require about 2 years more.

Republic expects that ore from this property can be delivered to its steelmaking plants in Buffalo, Youngstown, Warren, Ohio, Canton, Massillon, Cleveland, Chicago and Gadsden Ala., to its advantage.

### Concession Contains High Grade Ore At Ground Fe Content 68 Pct

By BILL LLOYD  
Cleveland Regional Editor

The surplus beyond Republic's requirements will be marketed by the Liberia Mining Co. to the world trade.

**The Liberian iron ore** deposit is located in a concession held by Lansdell K. Christie and Associates, New York City.

THE IRON AGE learned this week that Edward R. Stettinius Jr., former U. S. Secretary of State, former president, General Motors Corp., and chairman of the board of U. S. Steel Corp., from 1938 to 1940, is a stockholder in Liberia Mining Co. Ltd.

Mr. Stettinius is also chairman of the board and chairman of the executive committee of Liberia Co., formation of which he sponsored with a group of associates in 1947 to develop the resources of Liberia.

Liberia Co. is jointly owned by Stettinius Associates Liberia Inc., (65 pct), the government of Liberia (25 pct) and the Liberian Foundation (10 pct).

Associated with Mr. Stettinius in Liberia Co. are Blackwell Smith, president and general counsel, formerly associated with NRA and WPB; Sidney De La Rue, vice-president, active in U. S. government service in various departments since 1918 and since 1947 an advisor to the Office of Near Eastern and African Affairs, Dept. of State; E. T. Merritt, formerly vice-president, General American Industrial Corp., and since 1947 vice-president, American Eastern Navigation Co., secretary and treasurer; and James G. McKay, secretary and assistant general counsel, who is also secretary and treasurer, National Tanker, Inc., and assistant secretary and treasurer, American Overseas Tanker Co.; Joseph A. Moran, vice-president and assistant secretary.

On the executive committee of Liberia Co. are James G. Mooney, president and board chairman, Willys-Overland Motors, Inc.; Honorable Joseph C. Grew, former U. S. Ambassador to Japan from February 1932 to Dec. 8, 1941; Fleet Admiral William S. Halsey, Jr., retired; Philip D. Reed, chairman of the board, General Electric Co., also board chairman of International General Electric Co.

Liberia Mining Co.'s 3 million acres are in the form of a circle, about 80 miles in diameter. Mineral rights run for 80 years.

According to a report by a U. S. Dept. of Interior Geological Mission to Liberia in 1944-45, the iron ores are of two types high grade magnetites and banded iron formation consisting of quartz and iron oxides.

Principal deposits, according to reports, are on a ridge 6000 ft long and 400 ft high. Smaller deposits are located in the nearby hills. Largest ore body is 1550 ft long and from 45 to 150 ft thick.

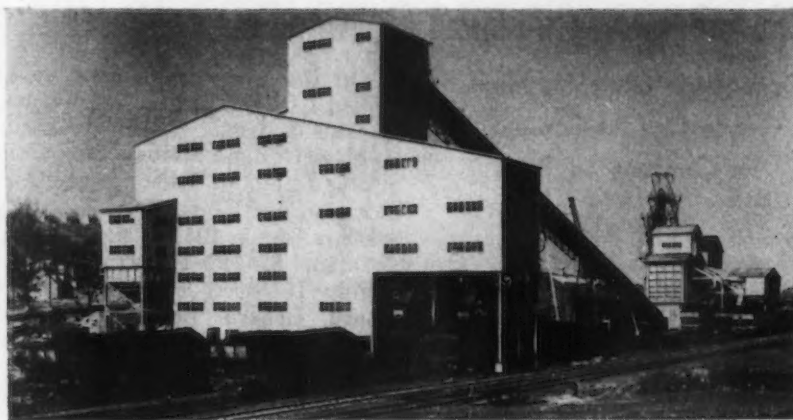
Reserves of high grade iron ore in Bomi Hills are about 5 million and 9 million tons of probable ore that is thought to average 66-68 pct iron, 2-3 pct silica, 0.06-0.08 phosphorous and 0.03-0.05 sulfur.

Reserves of milling grade ore consisting of iron formation and low grade silicate bearing ore are estimated to be 75 million to 150 million tons. This iron formation averages 42 pct iron, 37 pct silica, 0.045 phosphorous and 0.03 sulfur.

In the early 1930's a Dutch syndicate obtained a concession to explore the mineral deposits of Liberia. This group explored diamond deposits without results and then began on the iron ore deposits. The Dutch relinquished this concession and the iron ore exploration was taken over in 1935 by another Dutch syndicate.

This syndicate drilled, under German direction, reported about 6500 ft of diamond drill holes and thoroughly sampled the Bomi Hills deposits. The concession was cancelled.

In July 1938, the U. S. Steel Corp. was granted an exclusive concession for a 6 month's period.



## New Coal Washing Plant Feeds Republic Furnaces

Cleveland

• • • Construction of a new coal washing plant in Russellton, Pa., has been completed by Republic Steel Corp. The new plant will process all coal mined at Republic's Russellton mine and the company's Indianola mine, located about 8 miles away in the Freeport seam area. This coal is coked and used in Republic blast furnaces in Canton, Massillon, Cleveland, Youngstown and Warren.

As a result of this construction, virtually all coal supplied to Republic's Ohio steelmaking operations will now be improved through removal of impurities by washing. This will provide a more uniform quality coal for the company's blast furnaces and will permit better blast furnace operation with expected slight increase in pig iron output.

The coal washing plant will handle 450 tons of raw coal per hr. About 5500 to 6000 tons of washed coal are shipped per day.

Coal mined at Russellton is crushed to a maximum of 3½-in. and dumped from the mine tippie into a 200-ton bin. Coal from Indianola is crushed at the mine, brought by rail and dumped into a foreign coal bin. Both the Russellton storage bin and the foreign coal pit feed onto a 300 ft belt conveyor which carries the coal to the top of the coal washing plant. There the ¼-in. minus slack is screened out and washed separately on 16 Diester tables. This fine coal is dried and filtered in Bird filters and then loaded in cars.

The coal above ¼-in. size is conveyed to flotation tanks containing a solution of water and sand at a specific gravity to furnish the desired quality of coal. The coal is floated off and passed over screens to remove the water and sand, then loaded into railroad cars for shipment. Sink material, or refuse, is conveyed to a refuse bin, then trucked to a refuse pile near the mine. Both sand and water are recovered and re-used.

Republic also operates coal washing plants at its Clyde and Banning mines south of Pittsburgh and at its Republic Kentucky mine. All coal produced in Republic's northern coal district is washed in one of the four plants except that coming from low volatile coal fields in West Virginia.

## Wins Safety Trophy

Boston

• • • Perkins Machine and Gear Co., Springfield, Mass., was awarded the grand trophy offered each year by the Associated Industries of Massachusetts for industrial safety at a luncheon, Mar. 14, in the Hotel Statler, Boston. Lever

Brothers Co. and Continental Screw Co., New Bedford, won second and third places in the contest conducted by Massachusetts Safety Council.

The Perkins firm in competition with 300 companies operated in 1948 for a total of 1,170,655 man-hours with a record of one injury involving 3 days' lost time.

## Russia Got Only 500 Tons of Equipment In American Zone in 1948

Washington

• • • Less than 500 tons of plant equipment were taken out of the United States zone in Germany in 1948 by Russia in the form of reparations, the Army Dept. has informed Congress.

This amount was confined to miscellaneous equipment left in plants previously dismantled by the U.S.S.R. under allocations by the Allied Control Authority in 1945 and early 1946, a spokesman said. Such removals are now said to be complete.

In reply to an inquiry made by Senator Knowland, R., of Calif., the Army informed him that an additional 67,000 tons in reparations had been shipped to three satellite nations — Albania, Czechoslovakia and Jugoslavia — from the British, American and French zones.

The latter consisted of equipment and machinery allotted to the three countries by the Inter-Allied Reparations agency under an agreement made in January 1946, it was explained.

However, the Army said, more than \$12 million worth of machinery and equipment other than reparations had been shipped to Russia and the satellite nations from Germany in 1948. This was in exchange for raw materials needed by bizonal Germany, such as steel, food, clothing, shoes, textiles, etc.

While there is no specific breakdown in the bizonal exports, the Army said that in general they included electrical equipment, machinery, vehicles, machine parts, mining equipment, optical materials, chemicals, etc.

## Holds 4-Day Conference

Detroit

• • • More than 200 representatives of the J. B. Ford Div. of Wyandotte Chemicals Corp. held a 4-day conference in Detroit recently.

During the sessions specialists in cleaning operations, chrome plating, bottle washing, power laundering, building maintenance and kindred industries discussed the present business situation.



## Warns of Scrap Complacency; Sees Less Imports; Urges Export Barriers End

St. Louis

••• There is danger that the present easier supply situation in iron and steel scrap may breed a sense of complacency and lay the groundwork for a return to a condition of shortage, Edwin C. Barringer, executive vice-president, Institute of Scrap Iron & Steel, Inc., declared at the annual consumers' dinner of the St. Louis chapter last week.

The record performance in scrap in 1948, when 29 million gross tons was consumed and 1¼ million tons was added to consumers' inventories, was made possible only by the fullest and most efficient operation of the scrap machinery of the country, according to Mr. Barringer.

"It is in the best interests of the steel, foundry, and scrap industries that a steady market for scrap be maintained in order that dealers can continue to collect and prepare scrap in an orderly fashion, and not only meet current requirements but also be in position to cope with any national emergency."

Lagging interest of consumers in German scrap due to the greater availability of domestic scrap will result in a decline in imports beginning in the second quarter, Mr. Barringer predicted. He urged that barriers to the movement of scrap to Canada and Mexico be lifted.

"Both of these neighboring countries normally depend on the United States for a substantial portion of their scrap requirements. If domestic consumers drop out of the market, dealers should be permitted to sell to neighboring countries as one means of keeping their machinery for the collection and preparation of scrap going."

### Norge Reports Changes

Detroit

••• Norge-Heat Div. of Borg-Warner Corp. has announced a consolidation program to meet changing market conditions. The manufacturing of all types of warm-air, home-heating products will in the future be located at

plants in Kalamazoo, Mich., and Ellwood City, Pa. The division's plant at Hammond, Ind., will be closed.

The Norge-Heat line of home-heating products will be considerably enlarged to include a complete new line of gas-fired, air-conditioning furnaces. The first of the new gas products to be released is the super-package, air-conditioning furnace. This furnace requires slightly more than

2 sq ft of floor space and is being produced as the company's contribution to the new low-cost, home-building program.

### Joins Research Program

••• E. I. Du Pont de Nemours & Co. has joined the University of Chicago's \$12 million basic atomic and metal research program. Du Pont will pay \$100,000 for a 5-year membership in the Institute of Metals. Du Pont thus became the seventeenth large industry to join the research program established by the University of Chicago 2 years ago.

## 50 YEARS AGO

THE IRON AGE, March 16, 1899

• A report on hardening steel said, "It is found by experience that an immersion in cold water and allowing it to remain there no longer than is sufficient for hardening the outside to a proper depth can only be learned from observation, as the tool-smith must be guided entirely by the bulk of the article to be hardened and a hissing sound which the steel produces in the water while cooling. This certain sound, and at times a tremor, indicates the effect to be produced. As soon as he discovers the effect by the above process, the steel should be immediately taken out of the water and immersed in oil."

• "The number of coke ovens now in blast in the Connells-ville region passes all previous records. Out of a total of 18,000, more than 16,000 are active, and it is announced that all the idle ones will be fired up within the next few weeks."

• "The National Steel Company have purchased the blast furnace of the Thomas Furnace Co., at Niles, Ohio. This fur-

nace is 76 x 17. The original stack was built in 1870, was enlarged in 1883 and torn down and rebuilt in 1890, and contains entirely new equipment. It has four Massick and Crookes stoves, and the daily capacity is about 300 tons. It is stated that the National Steel Co. are negotiating for the purchase of several more blast furnaces in the Mahoning Valley."

• "Notwithstanding the advanced rates offered for Lake vessel tonnage, the *Marine Review* of Cleveland, Ohio, says that there are no more boats available now than at the old rate of 60¢ per ton for iron ore, and that journal predicts that rates will go higher."

• "From Ansonia to Torrington every mill in the Naugatuck Valley is pressed hard with work. Last week the mills were running until 9 and in some cases 10 o'clock at night. The consumption of brass goods is excellent despite the stiff position which both copper and spelter have maintained."

## Construction Steel . . .

• • • Fabricated steel awards this week included the following:

- 4500 Tons, Marietta, Ohio, bridge and power house, Electro Metallurgical Div., Union Carbide & Chemical Co., to American Bridge Co., Pittsburgh.
- 4145 Tons, Camden, N. J., Parkview apartment building to American Bridge Co., Pittsburgh.
- 760 Tons, Minneapolis, Minn., State highway bridge No. 6663 through Fielding Shepley, Inc., St. Paul, to Bethlehem Steel Co., Inc., Bethlehem.
- 365 Tons, Lorado, Texas, power station for Texas Power & Light Co., through Sargent Lundy Co., Chicago, to Consolidated Steel Co., Houston, Texas.
- 250 Tons, Boston, Mass., new Hoosac Pier at Charlestown for Commonwealth of Massachusetts to West End Iron Works, Cambridge, Mass.
- 200 Tons, Seattle, hangar at Bow Lake Airport for United Air Lines, to Isaacson Iron Works, Seattle.
- 175 Tons, New York, Nostrand Ave., Sheepshead Bay and Livonia Ave. sub-stations,

Board of Transportation, to Grand Iron Works, New York.

• • • Fabricated steel inquiries this week included the following:

- 2800 Tons, Poughkeepsie, N. Y., Building No. 98 for State of New York.
- 500 Tons, Clifton, Ariz., bridges and overpass on Safford-Clifton Highway, Arizona State Highway Commission, Phoenix, bids to Mar. 24.
- 400 Tons, Nashville, Tenn., federal office building.
- 250 Tons, Herdlyn, Cal., U. S. Bureau of Reclamation Spec. 2593. Will close Apr. 5.
- 200 Tons, Louisville, Mont., Penstocks, U. S. Bureau of Reclamation Spec. 2577. Will close Mar. 24.

• • • Reinforcing bar awards this week included the following:

- 400 Tons, Seattle, Northeast Jr. high school, through J. G. Watts and S. Birch & Sons, to Northwest Steel Rolling Mills, Inc., Seattle.
- 225 Tons, Taunton, Mass., sewerage plant

- through Gil Wyner Co., Inc., to Isaacson Steel Co., Boston.
- 210 Tons, Yakima, Wash., municipal building, through John Sellen, to Northwest Steel Rolling Mills, Inc., Seattle.
- 200 Tons, Seattle, Federal Reserve Bank, through Kuney Johnson, to Northwest Steel Rolling Mills, Inc., Seattle.
- 100 Tons, Fort Richardson, Alaska, warehouse, through Henry Valle, to Northwest Steel Rolling Mills, Inc., Seattle.
- 100 Tons, Missoula, Mont., Fox theater, through H & L Building Co., to Northwest Steel Rolling Mills, Inc., Seattle.
- 100 Tons, Moro, Ore., grain elevator, through Central Construction, to Northwest Steel Rolling Mills, Inc., Seattle.

• • • Reinforcing bar inquiries this week included the following:

- 1035 Tons, Tracy, Calif., Delta-Mendota canal near Los Banos, bids to be called by Bureau of Reclamation, Tracy, about Mar. 15 (to be opened at a later date).
- 125 Tons, Prineville, Ore., rehabilitation of Ochoco dam, bids to be called by Bureau of Reclamation about Mar. 22 (to be opened at a later date).

• • • Sheet steel piling inquiries this week included the following:

- 1000 Tons, Indian Harbor, Ind., bulkhead wall for Youngstown Sheet & Tube Co., Youngstown, Ohio.

## Tool Engineers

(CONTINUED FROM PAGE 131)

out producing more has caused present-day inflated costs and higher prices; forced the current trends toward the search for security through governmental pensions, welfare funds, hospital and unemployment benefits. While security, in itself, is a noble desire, it must be realized that payments for any security plan must come out in production.

The speaker stated that industrial plans at present call for spending about \$55 billion in the next five years, but these plans do not show what will be done if hampered by political action. More interesting than just the expenditure plans is the fact that manufacturing industries are shifting emphasis from plant expansion to operation efficiency. About 75 pct of the expenditures planned will be to replace and modernize facilities.

The session on processing aluminum consisted of two papers, one on recommendations for machining aluminum, by E. S. Howarth, chief of the metal-working division of Aluminum Co. of America, and the other on cold forming aluminum by drawing, stamping and spinning, by E. G. Kort, of Alcoa's jobbing division. W. W. Criley, of Ajax Mfg. Co., Cleveland, read a paper on "Design of Dies for Upsetting Forging Machines," and told of the developments of this method of hot forming. Dr. George A. Roberts, chief metallurgist of Vanadium-Alloys Steel Co., Latrobe, Pa., and Malcolm

F. Judkins, chief engineer of the carbide division of Firth-Sterling Steel and Carbide Corp., McKeesport, Pa., described improved methods of processing corrosion resistant alloys, including stainless steel, Monel, heat resistant alloys, magnesium, molybdenum and stellite. Dr. Roberts covered the metallurgy of cold forming and cold heading die materials and Mr. Judkins described the machining practices on these metals.

## Lone Star Plans New Plant, Asks for Loan

Dallas

• • • Lone Star Steel this week submitted final details on its planned steel plant to the local RFC office. The plans plus the formal application for a \$65 million government loan were then forwarded to Washington.

The steelmaking facilities detailed for stage No. 1 of The Lone Star program included four 165-ton stationary openhearth; a 40-in. reversing blooming mill; a 2-stand 110-in. plate mill; a 6-stand, 4-high continuous hot strip mill and a single stand 4-high cold reducing sheet mill.

In addition was an electric weld pipe mill plus all auxiliary equipment such as heating furnaces, picklers levelers, straighteners, shears, etc. The facilities, George D. Ramsey, vice-president, operations, told THE IRON AGE, will produce 427,000 net tons of ingots

annually. From this Lone Star can make 200,000 net tons of electric weld pipe, 70,000 net tons of sheared plate, 22,000 net tons of cold-rolled sheet and 21,000 net tons of hot-rolled sheet.

Lone Star officials told IRON AGE work on the new plant would be started immediately after the approval of the loan. They estimated the plant would be producing steel within 12 to 18 months after construction is begun.

John W. Carpenter, chairman of the board, Lone Star Steel Co., resigned Mar. 11th. Mr. Carpenter's resignation was due to the fact that he felt the huge building program of Texas Power and Light Co. of which he is president, demanded his full attention.

• • • Lone Star Steel annual report for 1948 shows a net income of \$3,201,534 or \$2.91 per share. The consolidated gross sales and operating revenues in 1948 amounted to \$17,394,166 of which \$14,553,702 was from the sale of pig iron. The earning ratio to net sales for the year was 19.402 pct.

## Declares 20¢ Dividend

Hagerstown, Ind.

• • • The board of directors of Perfect Circle Corp., Hagerstown, Ind., at their meeting recently, declared a regular quarterly dividend of 20¢ per share, payable Apr. 1, 1949, to stock of record at close of business Mar. 4, 1949.



## Metal Powder Show To Exhibit Principles Of Magnetic Fluid Clutch

New York

••• Operating models demonstrating the unique principles of the magnetic fluid clutch will be exhibited by the National Bureau of Standards at the Metal Powder Show to be held Apr. 5-6 at the Drake Hotel, Chicago. The models will also show some of the other unusual applications for this invention including its use as a simple magnetic valve, shock absorber, and as a special molding material. The action of these devices depends on the cohesive force of iron powder particles suspended in oil when subjected to magnetic forces.

In addition nearly every phase of the rapidly expanding powder metallurgy industry will also be represented by at least one exhibitor. Parts fabricators, press and furnace manufacturers, powder producers, and powder handling and testing equipment makers will all be exhibiting.

Fabricators of parts made from metal powders will display specimens of their latest products including leaded iron bearings, copper-lead steelbacked bearings, clutch facings, brake linings, and many other interesting developments. Some of the less common metal powder parts will be demonstrated in actual use in machinery to be set up by exhibitors.

Manufacturers of equipment used in powder metallurgy will be well represented at the show. An operating metal powder press will be set up and turning out small gears. Models of powder blenders and other powder handling equipment will demonstrate the operation of this type of machinery. Illustrations of the latest design in electric and gas-fired sintering furnaces will also be shown. A well-known metal powder particle size analyzer is scheduled to be on display and operating.

All the major producers of metal powders for use in powder metallurgy will be on hand to display their latest products ranging all the way from aluminum powder to zinc powder and covering a great variety of metals and alloys in between.

# Looking for ways to cut costs?



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## use a WELLS METAL CUTTING BAND SAW!

In thousands of plants all over the world, Wells Saws are proving that it is possible to cut metal faster and more accurately at lower cost. This is accomplished through machine design and the principle of *continuous cutting*. As each tooth does its share of the work, the blade is cutting all the time — there is no lost motion. This means more cuts per day and lower unit cost to you.

Three standard models of Wells Metal Cutting Saws are available to meet virtually every need. Use the handy chart below to find the saw you need to meet your requirements and ask your Wells dealer for complete information or write direct.

### DESIGN DETAILS

Saw No.	No. 5	No. 8	No. 12
Principle Use	General Utility	Utility and Production	Heavy Duty Service
Capacity, Rectangular	5" x 10"	8" x 16"	12" x 16"
Capacity, Rounds	5" dia.	8" dia.	12 3/4" dia.
Speeds, Selective	60, 90, 130 ft./min.	60, 90, 130 ft./min.	50, 90, 150 ft./min.
Power	1/3 H.P.	1/2 H.P.	1 1/3 H.P. & 3/4 H.P.
Weight, Approx.	425 lbs.	665 lbs.	1750 lbs.

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## Offers Color Film On Rail Steel Manufacture

Philadelphia

••• Rail Steel Bar Assn. recently produced a color motion picture showing the origin, production and application of rail steel. The picture is titled "Rail Steel in the World Today," with narration by Lowell Thomas.

The purpose of the film is to familiarize customers, architects, designing engineers, etc., with the manufacture of rail steel—also as an educational film to be used by technical schools and colleges. It is available to these groups without charge. Initial showings have received favorable comment.

Last week the film had its world premier over television under the sponsorship of Sweet's Steel Co. It was televised over station WPTZ Channel 3 in Philadelphia, with a trailer offering it to interested groups. This is probably the first time any steel company has used this means of education and advertising. The sponsoring company reports the response has been far greater than anticipated.

## Ford Man Retires

Detroit

••• Leslie V. Brown, who has distributed one car out of every four produced in this country has retired from Ford Motor Co. after 37 years of service. During Mr. Brown's tenure of office, Ford produced 28 million motor vehicles.

Brown, who is 55 years old, joined Ford in April, 1912, starting in the sales department. He was named head of Ford's distribution department in July, 1916, and has continued in charge of distribution since that time.

## Motor Vehicle Sales Up

Detroit

••• Factory sales of motor vehicles during January were the best the industry has reported in any year since the production of motor vehicles was resumed following the war.

A total of 431,284 motor vehicles were sold by the factory to auto dealers during January, an increase of 6 pct over January 1948.

**SEE WHAT'S HAPPENED  
TO WELDING ELECTRODES!**

Time was when you had to tackle almost every arc welding job with just one electrode. Now electrode types come by the score.

Nearly 20 years ago M & T started something with its Murex "hot rod" for downhand welding—one of the first electrodes engineered to do a specific job and do it better.

Today M & T is well out in front with the "SELECT 70."

Yes, now there are 70 types of electrodes in the M & T line—each one selected from a number of designs to give top performance on a particular class of work—each one picked to help you do the best possible job, more speedily, at lower cost.

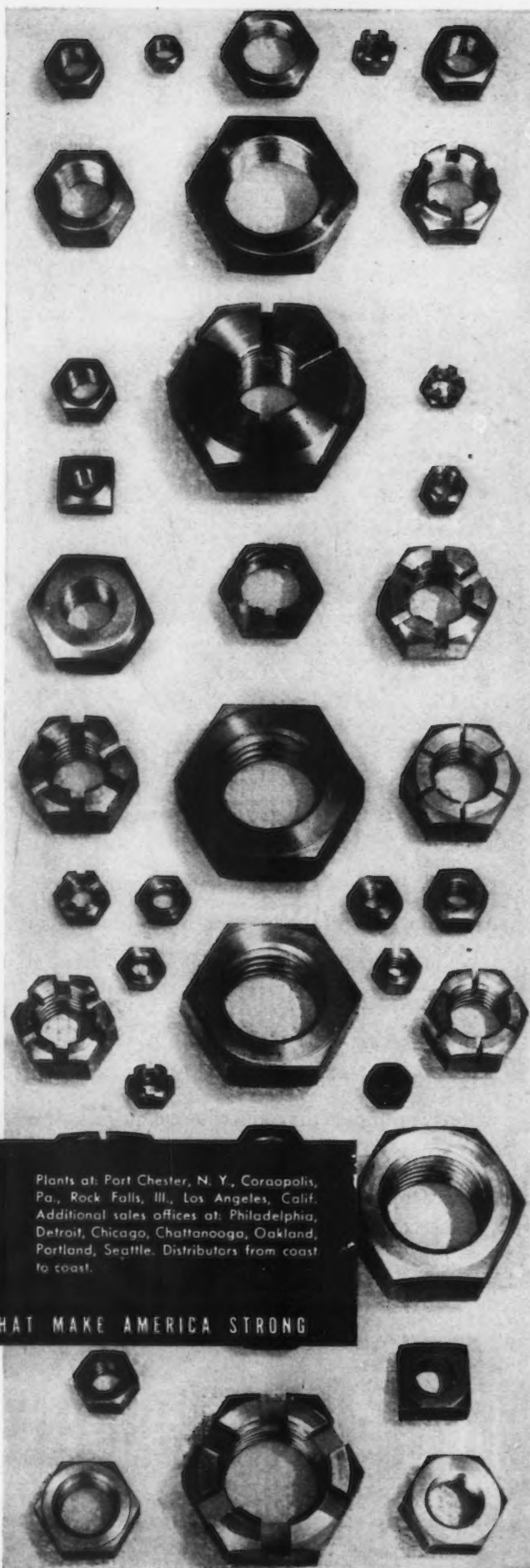
You need look no further than M & T's "SELECT 70" for easy selection of the right electrode for any application. Write today for your brief but comprehensive catalog.

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## Outlines Three Point Program for Future Supply of Iron Ore

Cleveland

• • • A three-point program to supply the future iron ore requirements of the Great Lakes steel industry and record net profit of \$9,087,574 for 1948 after all expenses and charges were reported to shareholders recently by George M. Humphrey, president, M. A. Hanna Co.

Pointing out that continuation of the declining trend in shipments of high grade direct shipping ore from Lake Superior is inevitable, Mr. Humphrey called for:

An increase in "expensive underground mining"—

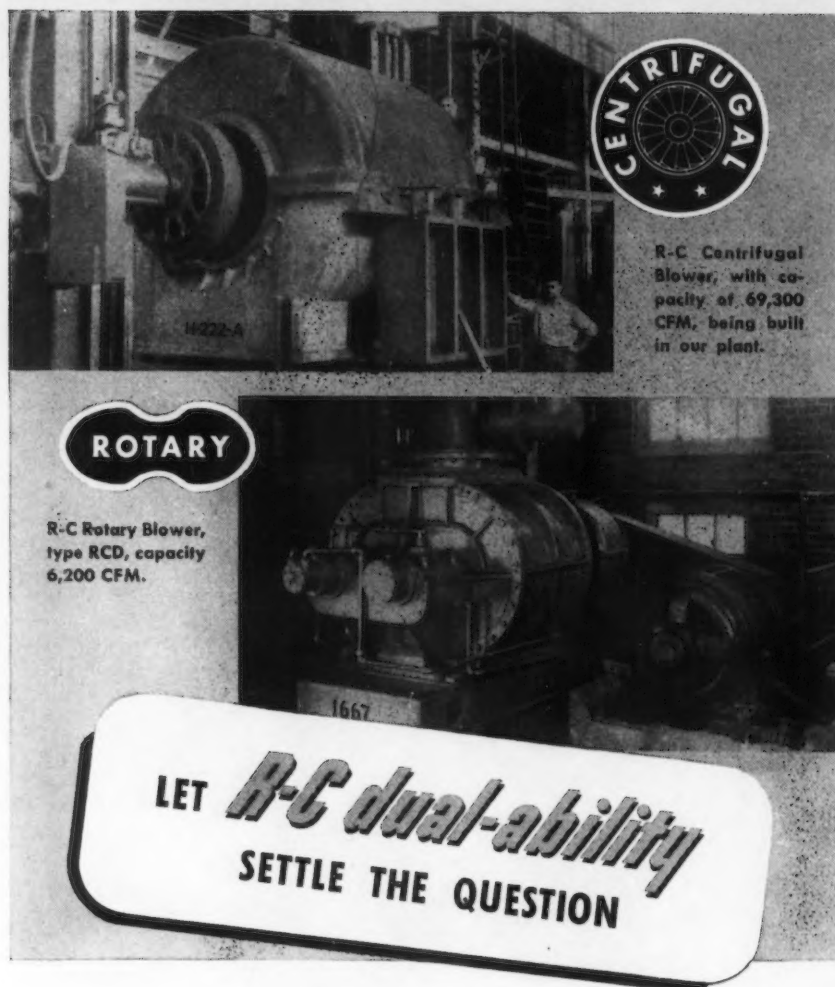
Development of "even more expansive beneficiation processes to make a useful product from lower grade Lake Superior reserves—

Prompt construction of the St. Lawrence seaway project to make the high grade open pit direct shipping ore from the Labrador Quebec deposits "equally available."

"The distance by water from Seven Islands to Erie, Pa., on the southern shore of Lake Erie, is almost exactly the same as the distance from Duluth, as our Lake Superior ores now move," he pointed out. "The entire distance from the Gulf of St. Lawrence to any lake port is now available for transportation in our regular standard lake vessels except for about 90 miles of intermittent rapids. If these rapids can be made navigable by the prompt completion of the St. Lawrence Waterway project, the ore can be moved economically and competitively to the central industrial districts of Canada and the United States," he added.

Mr. Humphrey said the existence of about 300 million tons of very good grade direct-shipping open pit ore has been proved. About two-thirds of the ore proved so far is in Quebec and only one-third is in Labrador, but the Labrador concession is nearly five times as large as the Quebec concession and is still mostly unexplored.

The ore fields are about 300 miles from the Gulf of St. Lawrence and will require the construction of 360 miles of railroad with transshipping docks at Seven Islands, Quebec, on the St. Lawrence River. With related costs the expenditure



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R-C Centrifugal Blower, with capacity of 69,300 CFM, being built in our plant.

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R-C Rotary Blower, type RCD, capacity 6,200 CFM.

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If you are in doubt about whether Centrifugal or Rotary Positive units will do the best job of handling gas or air on any specific application, you can obtain an unbiased answer from R-C *dual-ability*.

Because we build both types, in wide ranges of sizes and designs, we can make sound comparisons and can recommend without prejudice the units whose capacities, pressures, drives and other characteristics should deliver the best performance.

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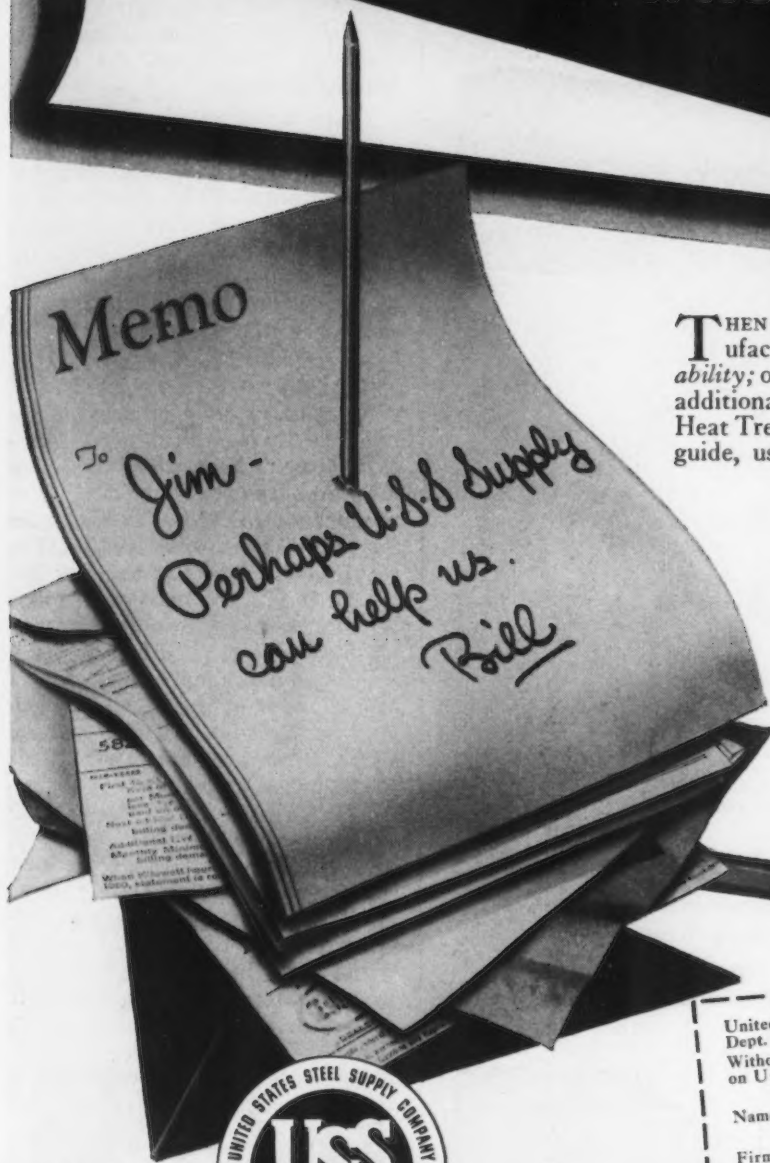
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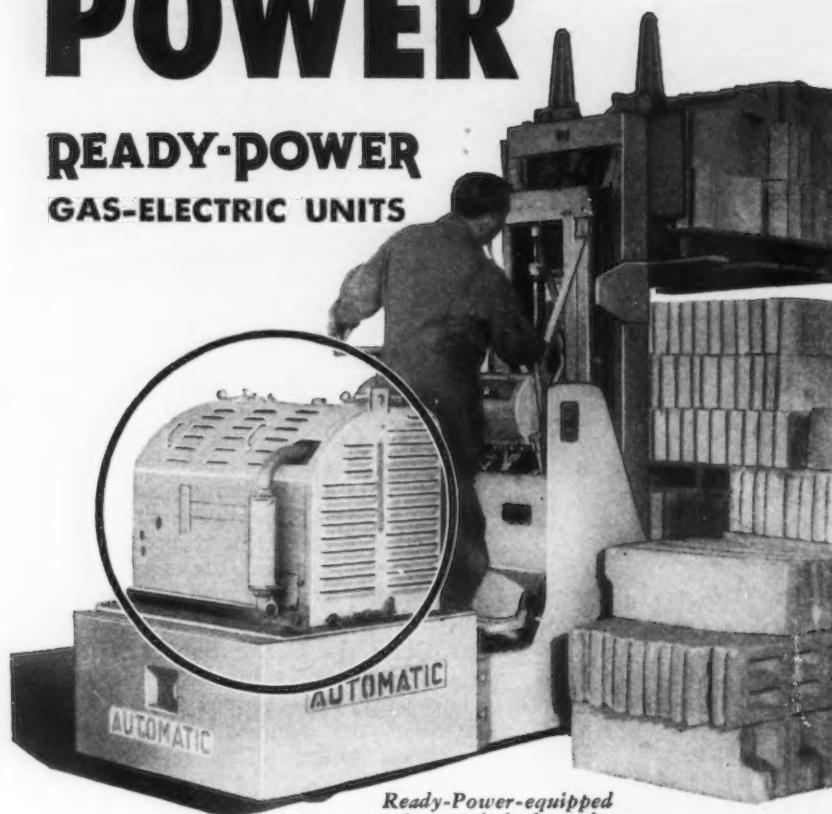
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UNITED STATES STEEL

# PLENTY OF POWER

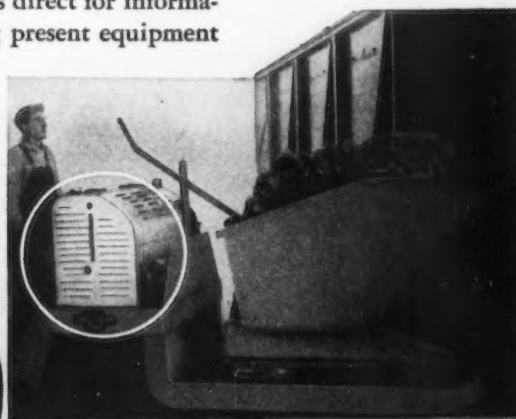
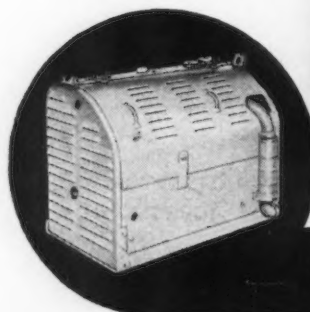
## READY-POWER GAS-ELECTRIC UNITS



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There is only one way to provide plenty of power for an electric truck—wherever and whenever needed—and that's to generate it constantly right on the truck chassis. Ready-Power gas-electric Power Units do just that, and do it efficiently and economically hour after hour, day after day. Specify Ready-Power on new truck purchases. Write us direct for information on converting present equipment to Ready-Power.

*Ready-Power-equipped  
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with dump hopper*



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of up to \$200 million may be called for, Mr. Humphrey said. "We believe the discovery is of sufficient importance, and the ore possibilities of such magnitude, that eventually this will become an important source of iron ore supply for some of the blast furnaces and steel plants of Canada and the United States," he stated.

"We are interested in the ownership of large reserve tonnages of Lake Superior iron ore. We are not unmindful of the importance of such reserves nor do we contemplate the early exhaustion of shipments from that district, but continuation of the declining trend of shipments of high grade direct shipping ore from Lake Superior is inevitable," he pointed out.

"Expensive underground mining must be increased and even more expensive beneficiation processes must be developed to make a useful product from lower grade Lake Superior reserves. They will be required as a source of iron ore supply for the future, but they can best be supplemented by shipments of high grade open pit direct shipping ore from Labrador and Quebec to fill the needs of the great iron and steel businesses of Canada and the United States now located in the Great Lakes basin area.

"The Great Lakes Waterway will continue to serve this important district, but now that this new source of direct shipping high grade iron ore supply has been definitely established the St. Lawrence Waterway should be undertaken promptly to make it equally available. It is essential for business in times of peace and it would be indispensable for both countries in the unfortunate event of another war."

### K-F Dealer Discounts Up

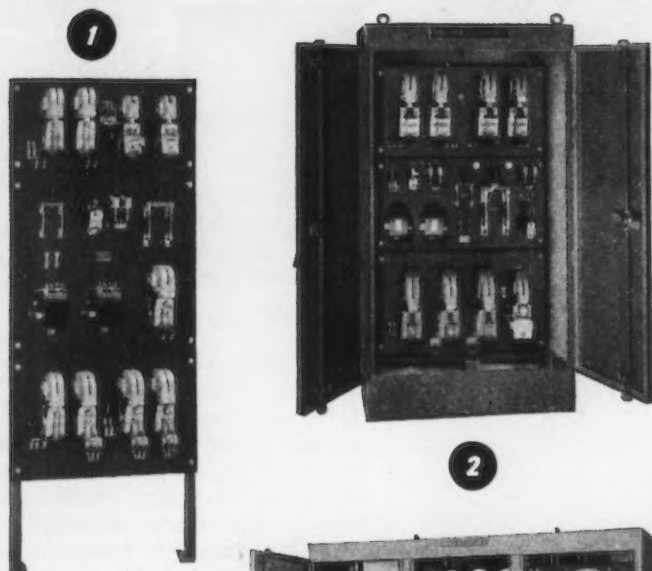
*Willow Run, Mich.*

••• Effective Apr. 1, Kaiser-Frazer Corp. will increase its dealer discount to the range from 24 to 28 pct. This is a boost of about 6 pct in the dealer's margin on various K-F models.

Temporarily, K-F is making a \$200 trading allowance for every car in dealer's stock which is replaced by a new car from the factory. The new car must be purchased within 7 days after date of retail delivery of the previous floor model.



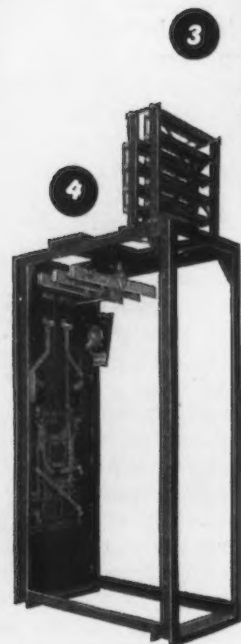
# STANDARD AND SPECIAL HEAVY-DUTY D.C. MILL AUXILIARY & CRANE CONTROL



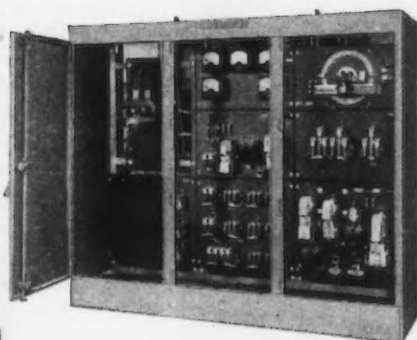
**1 Dynamic Lowering Control Panel** for cab-operated crane hoist. New network system gives surer hook control with only nine contactors. **STANDARD**



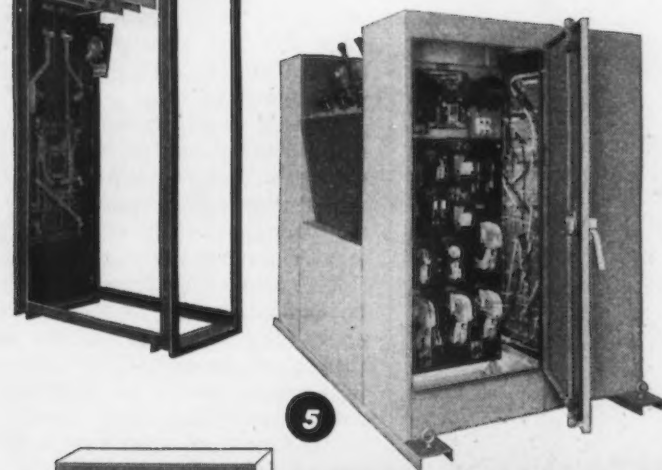
**2 Steel Mill Auxiliary Controller** for reversing, dynamic braking service. Features include automatic acceleration by pneumatic timers, mill type overload relays, heavy duty control relays and contactors. **STANDARD**



**3 Variable Voltage Controller** for continuous strip process line. With motor-operated field rheostat. **SPECIAL**



**4 Sectionalized Mill Control Panel** with frame, line bussing, resistor bank. **SPECIAL**



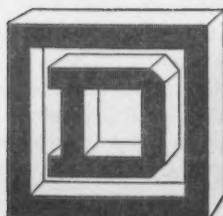
**5 Benchboard and Control Cubicle** for leveler and shear. Combination A.C. and D.C. control. **SPECIAL**

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## NEWS OF INDUSTRY

### Says Rail and Motor Traffic Are Rapidly Outmoding Bridges

*Schenectady*

••• The increasing demand for wider traffic arteries to accommodate motor and rail traffic is rapidly outmoding this country's present system of bridges, according to Carl B. Jansen, president of Dravo Corp., Pittsburgh.



Carl B. Jansen

Mr. Jansen, speaking at Founder's Day exercises at Union College, here, said that most existing bridges will have to be replaced to tie in with the requirements for a new super-highway system throughout the U. S. In his discussion on the future of bridge building, Mr. Jansen declared that prior to World War II, Germany in many respects was the leader in bridge design and construction but that the United States now is in the lead.

That our present bridges are becoming obsolete is evidenced by the San Francisco-Oakland Bay Bridge, he said.

"When completed in 1936 this bridge was assumed to be of sufficient capacity to handle all contemplated traffic for decades to come but has already become inadequate. Today, plans are under way for the construction of a parallel structure to ease the traffic congestion."

He said that America's technical skill, financial and political responsibility will play a large part in the replacement of European highways, railroads and bridge structures destroyed during the war.

The field of bridge engineering, he explained, has to place safety above all else and to forecast how future bridges will differ from existing ones would be difficult because every deviation from the present methods must have a background of reasonable certainty before it is used.

"Lighter metals are being used experimentally in bridge structures and may point the way to one major change. High tensile alloy steels provide certain features of improve-





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Type "A" thread is pointed for quick, clean starts in small drilled, clean-punched or pierced holes in lighter gauge metals.

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Design and production engineers realize the extreme importance of intelligent fastener selection. It is of primary interest to the designer, for instance, that fasteners have the holding power and durability to withstand strains and stresses imposed upon them. The production man insists upon quick-assembling fasteners with high torque strength. Fumbling and material waste cannot be tolerated.

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Make Lamson your headquarters for Tapping Screws, and be assured of trouble-free uniformity from a dependable source of supply.

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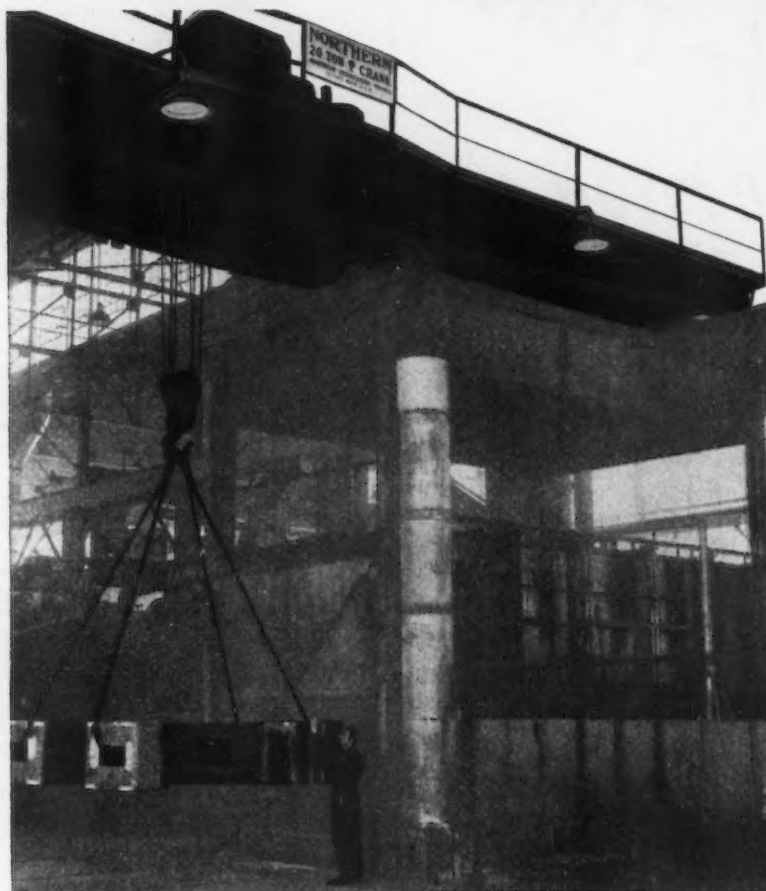
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### NEWS OF INDUSTRY

ment that are receiving consideration and are in use to a considerable degree. Welding techniques in place of riveting are gradually gaining deserved favor.

"There is ample room for improvement in every detail of bridge construction. Today's practice is nothing more than tomorrow's challenge to develop something different and better. Design and construction techniques may be adequate for our present requirements but it is reasonable to assume that current practices will be entirely outmoded 50 years from now," Mr. Jansen asserted.

### Improved Steel Supply Increases Auto Output

*Detroit*

••• An improved steel supply has made possible an increase in the production schedules of Ford and Mercury automobiles, Ford Motor Co. has announced.

Ford schedules are being increased so that March, April and May output of cars and trucks will average 92,800 units. Planned production for June is 87,000 passenger cars and 22,000 trucks, a total of 109,000 units.

The highest postwar production of Ford cars and trucks was December 1948 when 88,141 were produced.

Assemblies of Mercury automobiles will be increased from 13,637 in February to 19,800 in June, according to Ford officials.

### Operating at Full Speed

*Spokane*

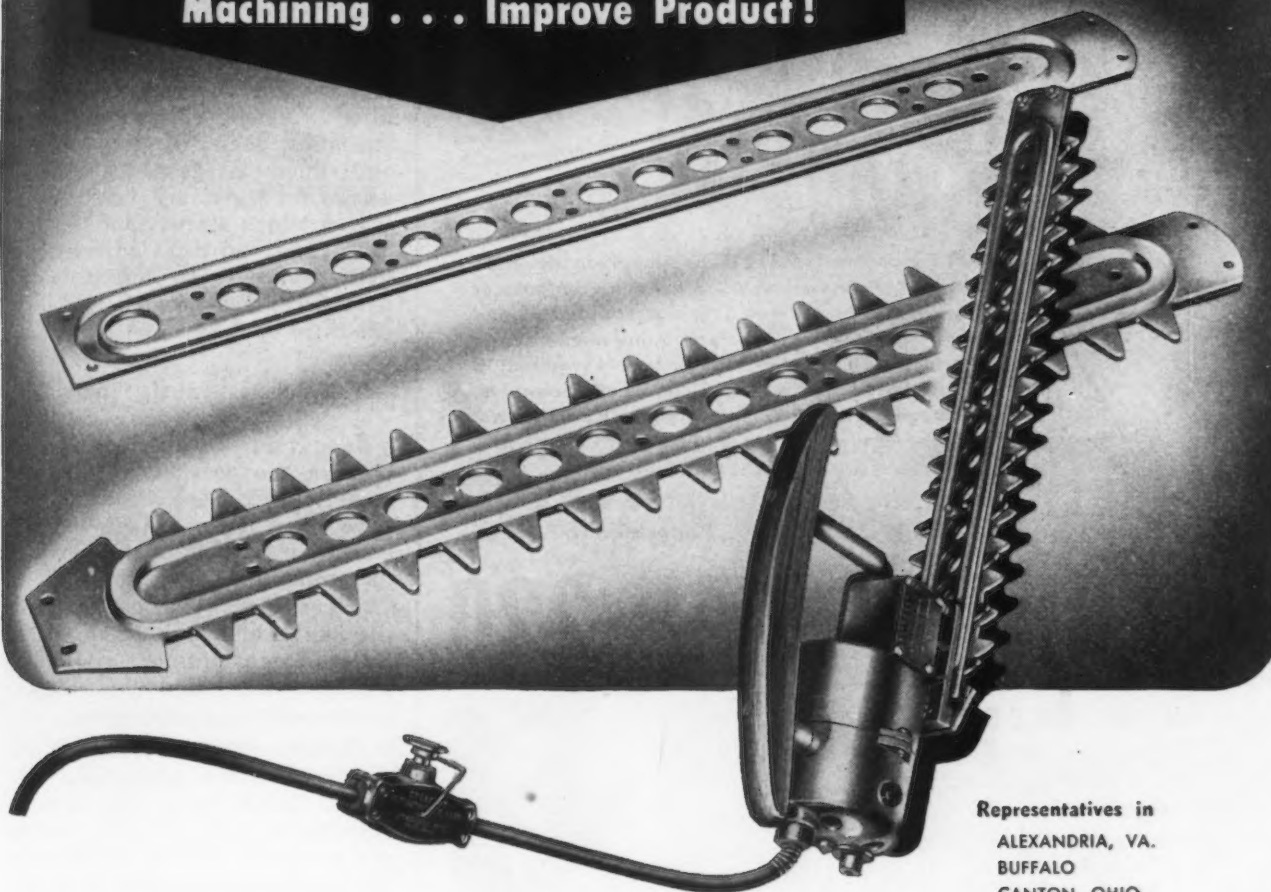
••• Almost capacity production has been attained at the Trentwood rolling mill of The Permanente Metals Corp. with the restoration of electric power which had been curtailed because of the severe winter. Last week 200 men, who had been laid off because of the power shortage, resumed work as a result of an increased supply of primary aluminum from the company's Mead reduction plant which had been hardest hit because of the power shortage.

The company recently announced that it had produced more than 125,000 net tons of aluminum during 1948 as compared to the 92,500 tons produced in 1947.



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**Presteel Stampings Eliminate Costly Machining . . . Improve Product!**



The cutter bar and chain cover for this power hedge shear graphically illustrate how Presteel combines craftsmanship and expert tool design with modern methods and equipment to produce stronger metal parts at lower cost.

Identical grooves in both parts are required, to a depth 50% beyond thickness, to permit free passage of the speedy chain. Previously, these grooves were machined, but removal of the metal weakened the structure.

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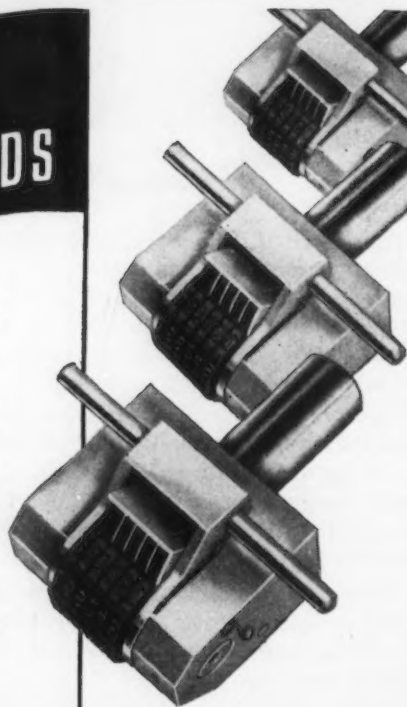
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## NEWS OF INDUSTRY

### Urges Adequate Profits For Highest Standards

Chicago

• • • Col. William F. Rockwell, chairman of the board, Standard Steel Spring Co., told a press conference here recently that we are living far beyond our income and yet our government is planning to spend billions more for subsidies, social security, health and educational benefits. He referred to dispatches from Washington which stated that the federal, state and local governments will spend over \$65 billion in the next fiscal year, which is nearly one third of the projected national income.

The Colonel stated, "Individuals who believe that they can live beyond their incomes eventually land in the poorhouse, jail or a mental institution. Nations which have lived beyond their incomes ended up with loss of liberty to dictators or to stronger nations. The political attack on profits is the subtle approach to socialism. Unless fair profits are allowed to industry in good times, industry cannot survive depressions."

The Standard Steel Spring executive told the pressmen, "The public must learn that federal corporation taxes are not paid by corporations, but are actually indirect sales taxes collected by corporations and turned directly over to the federal government." He continued, "High taxes and fear of nationalization brought about the decline in British industrial efficiency and paved the way for socialism." He pointed out that already the threat of government entry into business competition in this country has resulted in reduced capital expenditures in private industry and has brought about paralysis in the security exchanges.

He added, "Let us hope that there is still time to convince our people that we have outdistanced every other nation in past or present history through the individual competitive free enterprise system, which cannot survive without adequate profits; and, that the lowest standards of living and the greatest restrictions on personal liberty are found in the countries which have adopted socialism and communism."



## Detroit Figures for 1948 Show Good Business Year

### Detroit

• • • If business in Detroit is now coming apart at the seams the statistics for the year 1948 just released by the Detroit Board of Commerce were a poor barometer of what's happening here.

According to statistics compiled by John R. Stewart, board statistician, Detroit industrial payrolls during 1948 hit an all-time high of \$1,530 million. This is \$200 million more than 1947 and \$930 million more than the best prewar total established in 1937.

Estimated retail sales for Wayne County aggregated \$2.5 billion, an increase of 8 pct over 1947.

Employment by industry was 84 pct above the highest level for any year prior to 1941.

The value of goods manufactured in Wayne County was \$7.9 billion, or 12.9 pct above the 1947 total.

Factory workers' weekly earnings climbed to \$62.99 compared with \$58.64 in 1947, an increase of 7.4 pct, Mr. Stewart said.

Mr. Stewart estimated the cost of living here increased 7.9 pct during the year; the daily average of telephone calls was up 8.8 pct and electricity generated by the Detroit Edison Co. increased 8.8 pct.

Postal receipts were up 10.7 pct, reaching \$24,291,551 and bank clearings climbed 13.2 pct, aggregating \$20,069,165,417.

Total bank deposits were up 3.6 pct although savings deposits slipped 1.4 pct.

Declines were registered for Detroit Street Railway passengers which dropped 6 pct and the volume of gas sold which was off 8.1 pct.

Rising cost of new building is reflected by a drop in the value of building permits issued of 4.1 pct. The value of new residential construction slumped badly, falling 23.3 pct.

Based on the 1935-1939 average, the board's purchasing power index was down 0.8 pct to 119.

The Board of Commerce employment index for Feb. 15, 1949, shows a substantial increase as compared with 2 weeks earlier. Department store sales also showed an increase over January 1948, Mr. Stewart said.

## MATERIAL HANDLING *News*

Special metal containers, mounted on skids, holding approximately 5000 pounds of scrap are easily handled by a husky Clark Utilitrac. Fork-truck speed and versatility are particularly valuable in handling metals



No need of a pallet in handling big castings or other bulky units. There's practically no limit to the number of daily chores in a metals plant that can be performed quickly, safely and at remarkably low cost by Clark's 1000-lb. Trucloader



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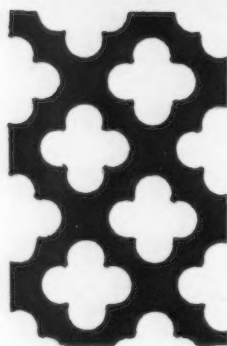
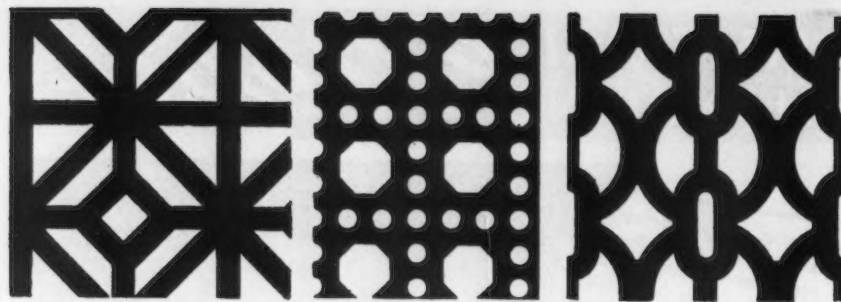
### TACKLE THOSE HANDLING COSTS!

It is one of the surest ways to protect and increase profits, say Industry's wisest counsellors; and one of the few remaining opportunities for appreciable savings. The Clark Method expands the capacity of any business by speeding up the flow of material. It increases storage capacity without plant expansion. It minimizes demurrage and costly accidents. It is good common-sense—and now is the time—to CONSULT CLARK.

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Regularly furnished in steel sheets of available stock size, in gauges from 16 to 22. These patterns can also be supplied in other metals on special order. Write for full information.



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### Radioisotopes Seen Best Bet for Next 10 Years

Chicago

• • • Radioisotopes, not atomic power, will be the chief benefit of atomic energy to industry during the next 10 years, according to Bruce R. Prentice, chemical engineer of the General Electric Co.'s nucleonics department, Schenectady, N. Y. Mr. Prentice told this to a public affairs meeting of the Chicago Assn. of Commerce and Industry Feb. 23 in Chicago.

"Atomic power involves difficult technical problems, and furthermore, costs cannot be estimated before we know what will go into the atomic power plant of the future," Mr. Prentice said that "judging from the report of the AEC, it does not seem possible, even under the most favorable circumstances, for atomic power to be commercially important before the next 20 years."

Radioisotopes, on the other hand, he explained, are available now for use in chemical, metallurgical and manufacturing industries. He cited the continuous measurement of a chemical process through the walls of a reaction vessel, without interrupting or disturbing the reaction in any way. Industrial laboratories throughout the country are just beginning to scratch the surface of the multitude of applications sure to be made in the next few years, the speaker said.

### National Malleable Net Up

Cleveland

• • • National Malleable & Steel Castings Co. made a net profit of \$3,041,181, for 1948, or \$6.40 a share, third highest in the company's history, Cleve H. Pomeroy, president, reported recently. Net compares with \$527,372 or \$1.11 a share in 1947.

After payment of \$949,722 in dividends, \$2 a share, the sum of \$2,091,459 was retained in the business, increasing book value of each share from \$38.94 to \$43.35.

Sales increased more than \$11 million over 1947 and totaled \$50,902,756. Profits before federal income taxes were \$5,624,181 and both sales and this profit were all time high records, Mr. Pomeroy



reported. Tax provision was \$2,583,000.

"Toward the end of the year, certain signs began to appear which indicated that an adjustment was about to occur which would lower industry in general to a level which might be considered more normal, and possibly, more healthy," Mr. Pomeroy said. "The order book of the company Dec. 31 was substantial, but it was lower than it was a year before, and competition in our industries was becoming more keen. This is not a cause of pessimism, but it is an incentive for added effort."

## Continental Steel Head Reports Good Business

Kokomo, Ind.

••• Continental Steel Corp., in its 22d annual report for the year ending Dec. 31, 1948, showed net earnings at \$1,625,150. This is equivalent to \$3.24 a share on the 501,620 common shares outstanding. This compares to the previous year when net earnings were \$1,296,874, equivalent to \$2.58 a share. Net sales of the corporation for the year totaled \$29,743,309 compared with \$27,086,139 in 1947.

Plant additions and improvements made last year include a new 3-high sheet rolling mill, complete with electric drive, bar heating and sheet normalizing furnaces. A new sheet galvannealing unit and new electric overhead cranes were put in operation during the year.

The company also installed a large capacity scrap compressor, additional propane storage tanks and the necessary pipeline equipment, thus insuring against interruptions in plant operations because of natural gas failure in case the commercial supply should be temporarily cut off.

R. K. Clifford, president, in his report to the stockholders, said, "While there is evidence of lessened need for certain basic and semifinished material for some manufactured items, we expect a reasonable strong demand to continue for the types of steel we produce. Hence, your management looks ahead to a satisfactory rate of operations throughout our various mills and departments."

# Arc welding helps cut fabricating costs of long span joists

LEACH STEEL CORPORATION, a prominent steel fabricator of Rochester, New York, had a problem fabricating several hundred steel joists running from 30-foot to 64-foot lengths. The established method of construction seemed too costly of both time and steel.



La Motte Grover, Airco Technical Sales engineer assisted in developing technical details and shop methods for welded fabrication. Airco Nos. 87 and 78E electrodes were recommended.

As Leach Steel Corporation put it:

"Welded construction provides greater freedom in structural design. It saves steel, time and money in fabricating built-up members. Further, a better appearance of exposed steel work is obtained, due to smoother surfaces and outlines."

### TECHNICAL SALES SERVICE — ANOTHER AIRCO PLUS-VALUE FOR CUSTOMERS

To assure its customers of high efficiency in all applications of the oxyacetylene flame or electric arc, Air Reduction has available the broad, practical experience of its nationwide Technical Sales Division personnel. The collective experience and knowledge of these specialists has helped thousands to a more effective use of Airco processes and products. Ask about this Airco "Plus-Value" service today. Write your nearest Airco office. In Texas: Magnolia Airco Gas Products Company . . . On West Coast: Air Reduction Pacific Company.



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# Here's help

## for shops machining stainless steel



THE increasing use of stainless steel is presenting new machining problems to many shops. D. A. Stuart Oil Co. has collected much valuable information on this subject from long experience and is particularly well qualified to assist the industry. For example: a Wisconsin plant had tried a wide variety of oils for tapping Type 310 stainless and was still getting but 50 holes per tap. With Stuart's ThredKut 99, used straight, they had secured 550 holes with one tap. In another plant, a Type 304 stainless steel union being made on a Cleveland Automatic was a slow and unprofitable job. A change to a 6 to 1 blend of Stuart's ThredKut 99 increased output from 18 to 31 pieces per hour and this is now one of the more profitable jobs in the shop.

These results are not exceptions, nor does D. A. Stuart profess to work miracles. It is simply that study plus trial and error on thousands of stainless steel machining jobs has given the company a worthwhile fund of knowledge on the subject. This experience and information is available to anyone interested in getting better finishes, longer tool life or faster production on stainless. For further information write, or call a D. A. Stuart representative.

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EST. 1893 LIMITED

2737 S. Troy Street, Chicago 23, Illinois



## NEWS OF INDUSTRY

### Alaskan Scrap Pickup Down

Seattle

• • • High cost of operating last year may prevent the Alaska Junk Co., which has 40,000 to 50,000 tons of iron and steel scrap available on the Aleutian Chain, from going after it this summer.

Private dealers state that this is not a profitable venture and the Alaska Junk Co. reports that it had to pay three times the normal shipping rate for scrap, or approximately \$47 per ton, to get this metal transported over 2500 miles separating the island from Seattle. Company officials further state that the cost of preparing the metal for shipment came to about three to four times the normal rate because of location and the type of scrap. These same men indicate that there is not a sufficient amount of salvagable material in the scrap for resale to help offset the excessive cost of handling and shipping it.

It has been suggested that the government itself, which is backing a drive for heavy scrap, consider the possibilities of moving this material to the mainland or providing for some subsidy to accomplish this purpose.

### Western Group to Meet

San Francisco

• • • The Western Div. of the American Council of Commercial Laboratories will hold its annual meeting in San Francisco, Mar. 26, 1949.

Dr. Roger W. Truesdail, president of Truesdail Laboratories, Inc., of Los Angeles, is the chairman of the Western Div. The vice-chairman is Herbert D. Imrie, president of Abbot A. Hanks, Inc., of San Francisco.

A considerable agenda of new and old business has been arranged for this meeting which will be held at the offices of Abbot A. Hanks, Inc.

The American Council of Commercial Laboratories numbers among its members many of the large well known commercial laboratories of the country. It demands the highest of ethical standards from its members. Its aim is to continually improve the standing of Commercial Laboratories in public opinion.

"it DOES make  
a Difference..."

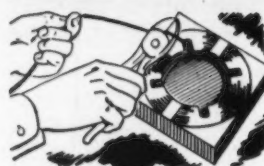
## what SHIM STOCK YOU USE



## Specify PRECISION BRAND

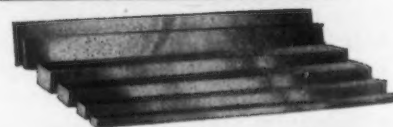
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## W. L. Batt Heads New Group to Foster Freer World Industrial Trade

Philadelphia

• • • Formation of a national committee to further understanding of the "urgent need" for freer world trade and to bring about U. S. participation in the International Trade Organization is announced by William L. Batt, president of SKF Industries, Inc.

Mr. Batt, who will serve as chairman, said the committee's operations will be directed by Charles R. Weaver, of the Studebaker Export Corp., South Bend, Ind., as executive assistant. Members of the committee, representing all sections of the country, are to be named within the next few weeks.

The group will actively campaign, he said, for congressional approval of the charter of the ITO, approved by representatives of 57 nations at Havana last year under the leadership of the then U. S. Assistant Secretary of State Will Clayton. The charter is designed to serve as a starting basis for the elimination of governmental barriers to the flow of international trade among the signatory nations.

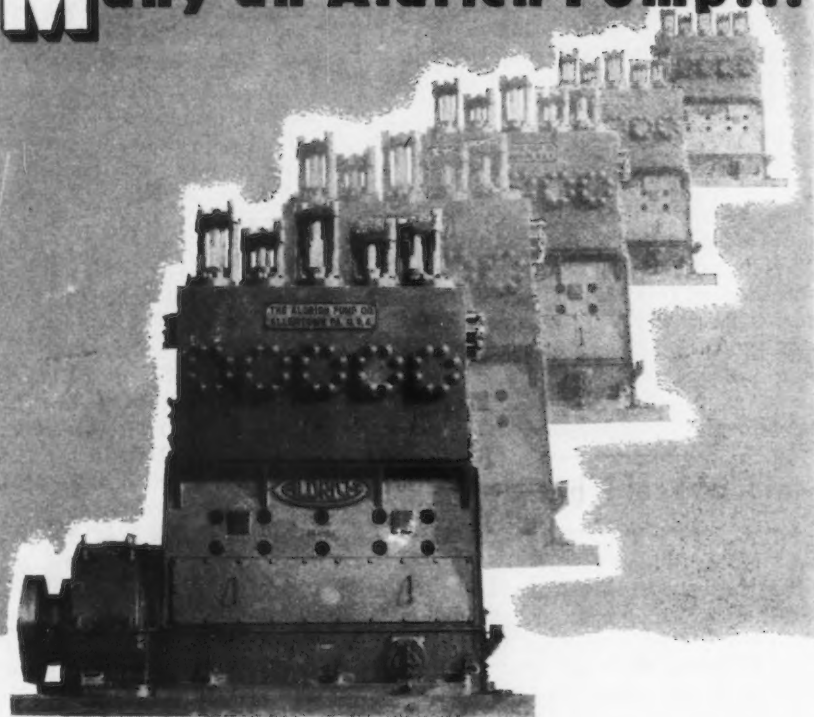
At the same time, Mr. Batt announced that the Foreign Traders Assn. of Philadelphia had gone on record as favoring early congressional ratification of the Havana Charter and said the support of other groups interested in expanding and stabilizing world trade "undoubtedly will be available on a broad front."

The committee, Mr. Batt said, will seek the "widest possible public understanding of the objectives of the Havana Charter and so contribute to favorable action by Congress in promptly ratifying this far-reaching agreement."

He likened its purpose to the groups headed by former Secretary of War Henry L. Stimson in behalf of the Marshall Plan and Gerard Swope for the Reciprocal Trade Agreements Act in that "all three pieces of legislation contribute to common international purposes of historic magnitude."

"The question of whether the United States should join the ITO is of prime importance," the Phila-

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... AND YEARS OF SERVICE—have proved that Aldrich designers and craftsmen are hitting close to their aim—high pressure hydraulic service with long life and low maintenance.

To have the *one pump* to meet your particular need, Aldrich builds many types of reciprocating pumps for a wide variety of applications.

Your requirements may demand the Aldrich-Groff "POWR-SAVR"—a variable stroke, constant speed, variable capacity pump built to handle any free flowing liquid and to provide working pressures up to 15,000 psi with minimum power consumption.

Or, you may need the Aldrich Inverted Triplex, Quintuplex, Septuplex or Nonuplex Pump, with constant stroke and constant speed. These Multiplex pumps range from 10 to 2400 HP and are available with built-in gearing, or can be directly coupled to the prime mover. The higher rated pumps are built to move large volumes of liquid against medium or high pressure.

For technical details, or for assistance in selection of the Aldrich Pump to fit your need, write now to The Aldrich Pump Company.

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THE **ALDRICH** PUMP COMPANY

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*The FIRST Name in Reciprocating Pumps*

delphia industrialist said. "If world trade is to thrive, there must be some set of international rules which will provide the framework for the solution of problems of mutual interest. These the Havana Charter provides insofar as possible when the views of so many nations had to be taken into account.

"The charter, drawn up after three years of negotiations, represents a compromise of many points of view, and the best that can be obtained at this time. The United States had a prominent part in writing the charter. It is to our own national interest that Congress approve this significant agreement."

### Motor Wheel Profit Up

Lansing, Mich.

• • • Motor Wheel Corp., Lansing, Mich., reports net profit of \$3,447,236 for the fiscal year ended Dec. 31, 1948. This compares with a net of \$2,225,089 for the fiscal year 1947. Net sales for the fiscal year amounted to \$58,339,674, an increase of 26 pct, the report said.

### Olds Official Pace Car

Lansing, Mich.

• • • Oldsmobile's new Series "88," powered by the new high-compression 135-hp "Rocket" engine, will be the official pace car for the 33d annual 500-mile race at Indianapolis Motor Speedway on Memorial Day. The car will be driven by Wilbur Shaw, president of the Speedway Assn.

### McLouth Steel Earnings Up

Detroit

• • • Net earnings of \$3,113,497 for the year 1948 have been reported by McLouth Steel Corp. as compared with \$1,757,475 for 1947.

In its annual report to stockholders, McLouth confirms earlier reports (THE IRON AGE, Jan. 13) that the steel ingot plant purchased from War Assets Administration and erected at Trenton, Mich., is now in operation and two additional 60-ton electric furnaces will be operating in April. The company plans to double its capacity, the report said. The in-

tegrated plant will include electric furnaces, soaking pits, blooming mill, hot mill and finishing facilities.

It is disclosed that the blooming mill and a 42 in. hot rolling mill are in process of being built.

According to Donald B. McLouth, president, during the past year McLouth has executed a first mortgage 4 pct, 10-year note for \$10,500,000 to the Reconstruction Finance Corp. McLouth also discloses the company has borrowed on second mortgage notes \$8 million "from certain of its customers." Ten-year 4 pct second mortgage notes have been issued to cover the indebtedness.

### Concrete Bar Needs Heavy

Toronto

• • • Power generation developments by the Ontario Hydro Electric Power Commission, and in other provinces, has created an enormous demand for reinforcing bars and this is likely to continue for several years, according to R. H. Macdonald, assistant sales manager of the reinforcing steel division of the Steel Co. of Canada Ltd. He said the Ontario Hydro alone has placed orders with a number of companies for 21,875 tons to be delivered by June 1951.

Mr. Macdonald further stated that reinforcing steel is being preferred to structural steel for many types of building, possibly partly because of the structural steel supply situation.

### UK Makes Steel for Pipe

Ottawa

• • • Canadian Trade Minister, C. D. Howe, stated that because of an arrangement to import 40,000 tons of steel from the United Kingdom it has been possible to allow the application of Imperial Oil Co., for steel pipe to construct an oil pipeline from Edmonton to Regina. The Imperial Oil application has been in abeyance for some time because the available steel facilities and supplies were all booked. It is understood the pipeline will require considerably more than the 40,000 tons, but arrangements have been made to completely fill the requirements.





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## Burroughs Adding Net Up

Detroit

• • • Burroughs Adding Machine Co. reports net earnings for 1948 totaling \$12,582,134 compared with \$6,255,775 for 1947.

According to John S. Coleman, president, Burroughs spent more than \$5 million on its modernization program and an additional \$2 million on the physical improvement of plant facilities. More than 70 pct of the expansion was made possible because of the increased earnings level, he said.

Unit production increased 49 pct over 1947 and 115 pct over 1946, the report said. A dividend of 75¢ per share has been declared, the same rate as in 1947.

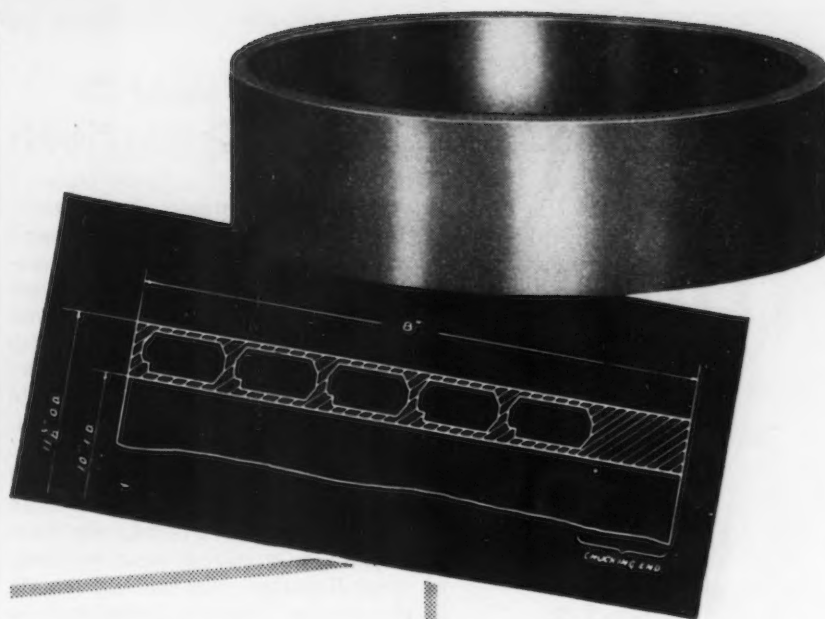
## Operating Extrusion Plant

Toronto

• • • Dominion Magnesium, Ltd., has placed its new extrusion plant in operation at Haley's Corners. The new plant will enable the company to offer magnesium for sale in all regular structural shapes and sizes.

### PRESS AGENT'S PIPE DREAM:

A fresh air fan is only a fresh air fan. But girls like Sally Rand have glorified other uses for the fan. Press agents' minds are quick on the trigger. So by giving pretty Dayle Rodney a fan to play with, the reader is bound to at least notice the new Fresh'nd-Aire Fanette which would probably have otherwise gone unnoticed.



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castings

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## BM Circular Issued On Clothes Change Houses

Washington

• • • The advantages of maintaining comfortable bathing and clothes-changing facilities at underground mining operations are described in an information circular recently issued by the Bureau of Mines. The circular describes four modern change houses at mines in the Lake Superior iron ore district.

Improvements in design and construction of modern change houses, the report points out, have largely eliminated overcrowding, poor lighting, slippery and muddy floors, the intermingling of men in mine working clothes and men in street clothes, hazardous dust, heat and high humidity, and inadequate facilities for clothes and bathing.

The change houses described in the report are representative fireproof installations of four companies in the Lake Superior iron ore district including the Castile Mining Co., the Cleveland-Cliffs Iron Co., the M. A. Hanna Co., and the Inland Steel Co. These are

only a few of the more recently constructed change houses of which there are many at underground iron ore mines.

Incorporated in the design of most of the modern change houses is a tunnel connected to the mine shaft. This permits the miner coming off shift to pass directly to the change house where he is cooled gradually rather than abruptly by exposure to the usually cold outdoor temperatures. Controlled heating and ventilation insure dry clothing and a healthful atmosphere and other facilities reduce health hazards commonly associated with mining operations, the bureau report discloses.

Diagrams of floor plans and heating systems are included in the information circular along with illustrations of mine clothes rooms, shower rooms, toilet and washroom facilities, clothes lockers and boot washers.

A free copy of the publication, Information Circular 7489, "Change Houses in the Lake Superior District," may be obtained from the Bureau of Mines, Publications Distribution Section, 4800 Forbes St., Pittsburgh 13.

## Hits 3 Millionth Car

Detroit

• • • Recently Pontiac joined the handful of automobile producers who have produced 3 million cars.

The three millionth car was driven off the Pontiac line by Harry J. Klingler, head of the division since 1933. Mr. Klingler was directing sales of Chevrolet when that division had its first million-car year.

The City of Pontiac is planning a celebration commemorating the event. Mr. Klingler will be guest of honor. The first Pontiac produced, a 1926 coupe, will be displayed at the luncheon.

Pontiac Div. completed its first-million cars in 1935, the tenth year of production. This total was doubled by 1940. Due to the war interruption, the three millionth Pontiac was not assembled until last week.

Pontiac production at the present time is 1100 per day, but this figure is expected to be increased

to 1250 within the next 60 days.

Mr. Klingler predicted business for Pontiac should be good for at least another 6 months. This will include the main production plant at Pontiac as well as the seven assembly plants located throughout the country, he said.

Mr. Klingler observed that the steel situation, while somewhat improved, is still a limiting factor in Pontiac's production. He indicated that the volume of replacement parts is nearly five times the prewar pace as measured by dollar volume.

## Laclede Sales a Record

St. Louis

• • • Laclede Steel Co. reports net sales for 1948 of \$34,072,411 establishing a new high in sales tonnage and dollar volume compared with \$26,283,120 in 1947.

Net earnings were \$1,767,863 equal to \$8.57 a share compared with \$1,429,035, equal to \$6.93 a share in 1947.



## HOW ONE PLANT Streamlines MATERIAL HANDLING



Here's another example that shows how you can get fast, low-cost materials handling, right now. Before installing a Reading engineered system, this plant had to wheel heavy barrels to the mill via hand trucks. To streamline the operation, Reading Engineers were called in. A one-ton Reading Electric Hoist, operating on a built-in parallel trolley, was recommended. Now barrels move faster—less manpower is tied up—and the entire operation costs far less! Let Reading Engineers give you practical suggestions that can streamline your handling operations. Drop us a line for full details. No obligation, of course.



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# READING HOISTS

## NEWS OF INDUSTRY

### Canada's Metal Output Up

Toronto

• • • Canadian production of base metals during 1948 shows an increase over the year immediately preceding. Production of primary copper in 1948 totaled 241,900 tons compared with 225,900 tons in 1947.

Nickel production last year amounted to 131,100 tons against 118,600 tons in 1947.

Primary lead produced in 1948 amounted to 164,000 tons compared with 162,000 tons in the previous year.

Output of primary zinc last year totaled 232,000 tons up from 208,000 tons the year before.

Exports of copper in ore, concentrates and matte in 1948 totaled 28,555 tons compared with 29,093 tons in 1947 and in ingots, bars and billets, 116,169 tons against 87,477 the year before.

Nickel exports during 1948 totaled 131,839 tons against 117,056 tons in the preceding year.

### K-F Furnace Cuts Output

Salt Lake City

• • • Production of iron at Kaiser-Frazer Parts Corp.'s blast furnace at Ironton, which has been averaging 700 tons per day, is being temporarily reduced to 300 tons. The cutback, according to general manager E. J. Duffy, was prompted by a slow-down in automobile production for retooling and a consequent drop in demand by Kaiser-Frazer fabricating plants in the East.

The production cut involves the temporary lay-off of about 100 of the 350 employees at the Ironton furnace and half of the 125 employees at the Columbia beehive coke ovens. Mr. Duffy reports that the company expects to start recalling the men about Apr. 1.

Rumors that this cutback was made necessary by falling off in demand for Kaiser-produced pig because of a premium price apparently are unfounded. Competent observers believe that even though this pig was made available at competitive prices but few immediate orders would result but possibly some tonnage might be booked for the third and fourth quarters. The slackening in demand from western foundries and

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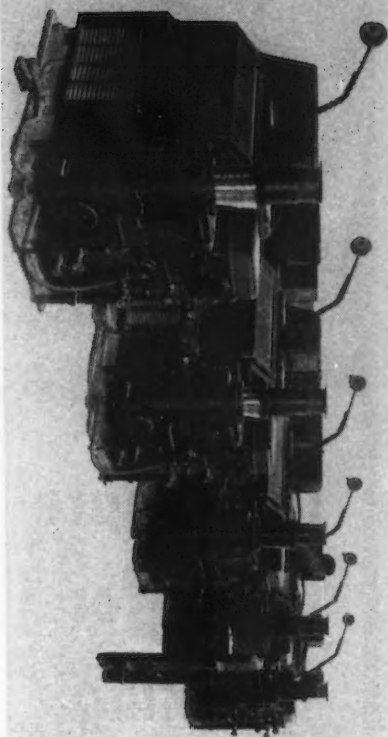
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an easing in supply of cast iron scrap has had a general softening effect on the pig market.

Blast furnaces of the Geneva Steel Co. at both Geneva and Iron-ton are operating at capacity as ore shipments begin to approach normal after the curtailment caused by the severe winter. The company recently announced a new high in production of 1,114,174 tons of ingots from its open-hearth furnaces for the year of 1948. A new high of 790,649 tons of finished steel was also set in that year.

Production of hot-rolled coils for cold rolling at the Pittsburg, Calif. plant of Columbia Steel Co. is increasing but still has not reached the rated capacity of the mill.

### New Officials Chosen By General Contractors

New York

• • • Adolph Teichert, Jr., president, A. Teichert & Son, Inc., contractors of Sacramento, Calif., was installed as president of the Associated General Contractors of America for 1949 as that organization completed its 30th annual convention here.

Mr. Teichert, who served as A.G.C. vice president during the last year, succeeded Dwight W. Winkelman, president, D. W. Winkelman Co., Syracuse, N. Y., contractor. The new A.G.C. vice president is Walter L. Couse of Walter L. Couse & Co., Detroit. Mr. Teichert's corporation specializes in heavy construction work; the Couse company is primarily active in the building construction field.

Newly elected A.G.C. directors included: J. W. Brennan, Brennan & Cahoon, Inc., Pocatello, Ida.; J. G. Bartholomew, J. G. Bartholomew Co., Dallas, Tex.; Chester W. Cunningham, Condon-Cunningham Co., Omaha, Neb.; Cecil D. Bartholow, W. E. Bartholow & Son Constr. Co., Huron, S. D.; Walter H. Ericsson, Henry Ericsson Co., Chicago; Fred I. Rowe, W. L. Johnson Constr. Co., Columbus, O.; Max C. Harrison, Harrison Constr. Co., Pittsburgh, and Albert D. Blakeslee, C. W. Blakeslee & Sons, Inc., New Haven, Conn.

Re-elected directors were

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REHEAT TEST 4 hrs. @ 3000 F.— Shrinkage	0.0%
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Charles L. Harney, Chas. L. Harney, Inc., San Francisco; Edward O. Earl, San Xavier Rock & Sand Co., Tucson, Ariz.; Carl E. Nelson, Carl E. Nelson Co., Logan, Utah; W. D. Amis, Amis Constr. Co., Oklahoma City; George C. Koss, Koss Construction Co., Des Moines, Ia.; Charles A. Long, Sullivan, Long & Hagerty, Birmingham, Ala.; F. L. Shackelford, Potter & Shackelford, Inc., Greenville, S. C.; R. P. Bayard, Johnson, Drake & Piper, Inc., New York City; S. L. Fuller, John F. Casey Co., Pittsburgh and Hal C. Dyer, Dallas, Texas.

### Holds Sales Conference

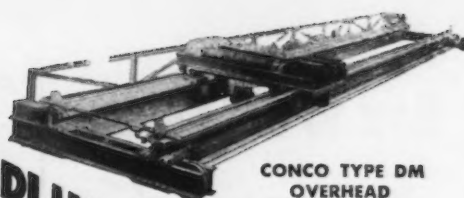
Columbus, Ohio

••• "Industries in all fields faced with the problem of leveling off and lowering production costs are demanding advanced types of more efficient machinery today," W. C. Denison, Jr., president of Denison Engineering Co., told field representatives and plant supervisory personnel of the firm at the close of a sales conference here recently. Purpose of the conference was to investigate market opportunities for oil-hydraulic presses and equipment this year.

**SMOOTHIE:** Using a portable grinder, a worker smooths the vanes of a cast steel Francis type water wheel runner for the first of four additional 35,000 hp, 92-ft head hydraulic turbines now under construction in Allis-Chalmers shops for TVA's Wilson Dam power house.



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## Adopts Powder Cutting In Heavy Scrap Preparation

New York

• • • Powder - cutting of skulls, buttons, and spills has been adopted by the Pittsburgh Works of Jones & Laughlin Steel Corp. with a great saving in time and money. Since November 1947, powder-cutting has replaced oxygen lancing as the method of reclaiming buttons from openhearth slag pots and salamanders from the blast furnace. At that time, 5000 tons of these large masses of iron and steel had accumulated. The cost of reducing many sections to charging-box size by lancing exceeded the value of the material, according to the company.

Experimental cuts were made, using the Oxyweld C-45 blowpipe developed by Linde Air Products Co. By adding a powder-cutting attachment it was shown that the speed of cutting could be greatly

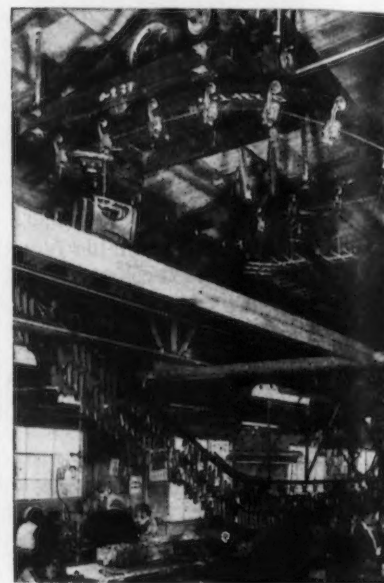
*Powder cutting techniques were described in detail in THE IRON AGE, July 11, 1946, p. 42, and Aug. 9, 1945, p. 61. —Ed.*

increased over that of using this large water-cooled oxy-acetylene blowpipe alone. In further experimental work, the oxygen lance was used in combination with the C45 blowpipe, and a further increase in the melting and cutting rate resulted. The lance kept the channels cut by the blowpipe free of molten slag. This new cutting method became standard operating procedure.

The button-cutting crew consists of a blowpipe operator, a helper, and a repair man. An average of 1000 tons of metal are reduced per month to sizes suitable for the openhearth furnace at the Pittsburgh Works. Practically all of the backlog of buttons and other heavy scrap has now been processed. At the present time, one blowpipe is in operation, working eight hours per day.

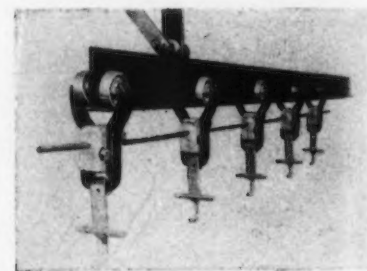
The powder-cutting process has proved so successful that an openhearth spill which previously required 30 working days to cut up by lancing, can now be cut to charging size in 2 working days. All types and sizes of buttons are effectively handled.

## ...ABOVE ALL Buschman Cable Trolley Conveyors reduce your handling costs



Buschman Cable Trolley Conveyors put your overhead space to work for you . . . reducing overhead . . . bringing costs down. In leading plants these Universal Cable Conveyors have proved to be the low-cost, durable and efficient method of handling light to medium loads. Easily installed or altered to meet changing conditions. Write for Bulletin 40.

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**TROLLEYS** (Pat. Pending). Have split driving lug castings bolted to all steel cable, with channel brackets and ball bearing wheels. **TROLLEYS** rated up to 160-lb. capacity spaced on 12" centers. Track 3" T. JR. with hanger lugs for bolted supports, dowel pinned joint.

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## Says Shipping Subsidies May Become Necessary

Washington

• • • Shipping subsidies, especially for tanker fleets, may become necessary in the near future in the interest of national security if shipbuilding steel is allocated to Europe under the ECA program, the Office of Industry Cooperation was told recently.

Allocations of 161,000 tons of steel for Scandinavian shipbuilding, to be shipped over the next 5 months, have been approved by the OIC and its Steel Industry Advisory Committee. Two thirds of the allocations would consist of plate and the remainder, sheet and strip.

Appearing against the allocation proposal were officials of the Shipbuilders Council of America, National Bulk Carriers, Inc., and Allis-Chalmers Mfg. Co.

American tankers are already being laid up, the OIC was told, because of lack of cargo, a trend which began about 2 months ago. Presumably, a substantial portion of the allocated steel would go into tankers.

The OIC was told that in effect the allocations program would set a precedent which in effect would build up low-priced shipping which would drive American flag vessels off the seas.

Appearing for Allis-Chalmers, Robert Lambreth said his firm was opposed only to allocation of transformer types of electric steel. Any diversion from domestic consumers, he said, would seriously affect transformer and other electrical goods manufacture.

## Appointed to Atomic Group

Washington

• • • Walter L. Maxson, vice-president of the Oliver Iron Mining Co., Duluth, Minn., has been appointed to the Atomic Energy Commission's Advisory Committee on Raw Materials.

Mr. Maxson has been vice-president of the Oliver Iron Mining Co. since 1944. Prior to that date, he was sales manager and chief engineer of the Mining Division, Allis-Chalmers Mfg. Co. for 17 years. He has also served as associate professor of metallurgy at the Colorado School of Mines, and has been

connected with several mining companies as a chemist, metallurgist and engineer in Colorado, Arizona and Australia.

## Ford Using Isotopes

Detroit

• • • "Radio-Isotope Applications in the Automotive Industry" was the subject of an address by Don M. McCutcheon, supervisor of Applied Physics Research at Ford Motor Co.'s Rouge plant before members of the Society for Non-Destructive Testing at the Fort Shelby Hotel, Mar. 10. McCutcheon told his listeners about tests currently being made at the Rouge plant of the Ford Motor Co. in which radio-active isotopes are used to maintain high quality standards.

Other speakers appearing on the spring symposium included Dr. E. E. Charlton, General Electric Co.; Walter Hampe, Westinghouse Corp., and John V. Russell, Republic Steel Corp.

## WAA Approves Transfer

Washington

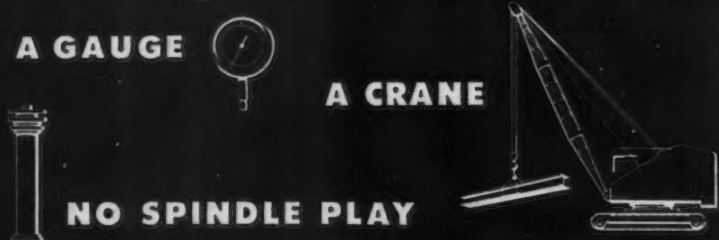
• • • War Assets Administration has approved transfer of the Pantex Ordnance Plant, Amarillo, Tex., to the Texas Technological College, Lubbock, Tex. Its present established fair value is \$8,159,964 and is subject to the National Security Clause.

The government said it reserved all subsurface minerals and rights of exploration and extraction. The school has informed WAA that it proposes to use the newly-acquired property for advance and graduate work in industry and agriculture.

## Selling Brooklyn Bridge

Portland, Me.

• • • The Brooklyn Bridge—only this one is in the State of Maine—is for sale. The longest cast iron bridge, 144 ft, near Bowdoinham and Brunswick is for sale as used metal so that a new steel structure can be erected in its place.



**A GAUGE**      **A CRANE**

**NO SPINDLE PLAY**

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Other assurances of long-life accuracy and speed are: the fastest longitudinal table speed (125 f.p.m.) available in any grinder; vibrationless rigidity achieved by massive one-piece column and base casting; patented vertical head adjustment; Bijur one-shot lubricating system.

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# MACHINE TOOLS

... News and Market Activities

## Machine Tool Business Continues Spotty With Exports Higher

• • • Preliminary reports from major sales sectors this week indicated that the machine tool business continues spotty, with about half the industry getting good order volume and the other half getting somewhat less.

Indications are that the February shipments topped January shipments by a small margin, particularly foreign shipments. New orders were about the same, with foreign business 15 pct to 20 pct higher, and a corresponding decline in domestic orders.

In Cleveland, a meeting between federal labor conciliators and representatives of Warner & Swasey Co. and its striking employees ended this week with no break in the deadlock that has defied all efforts for settlement of the strike, begun Dec. 27, 1948, by District 54, International Assn. of Machinists.

Negotiations were adjourned with the understanding that another meeting would be called as soon as the company submitted a draft of its proposed contract for consideration by the machinists union and the AFL Patternmakers Union. Another meeting was tentatively set for Mar. 21.

Participating in the meeting was William N. Margolis, assistant to Cyris Ching, federal mediation director.

The strike was called by District 54 in support of its demands for a 19¢ hourly wage increase, later reduced to 10¢ and paid holidays. Warner & Swasey offered increases ranging from 5¢ to 15¢ contingent on the union's dropping an incentive plan which provides automatic increases of 5 pct to employees with 5, 10, 15 and 20 years' service.

After the union rejected the company's offer, the company opened the entire contract, which expires Mar. 31, for renegotiation.

In Hartford, Frederick U. Conard, president, Niles-Bement-Pond

### Some Firms Are Getting Good Volume But Others Are Lagging Behind

• • •

Co., in an annual statement to stockholders, reported profit of \$1,219,960 for 1948, after taxes, compared with \$970,551 for 1947.

Net sales for the past year were \$22,334,068 compared with \$22,405,853 for 1947. Earned surplus was increased during the year to \$12,500,466 from \$11,754,116 the previous year.

Mr. Conard stated that prices on many items have had to be adjusted, but his company "believes the inflationary trend has abated and hopes to be able to hold the line against any further general price increase.

"There has been some conjecture in the press about the impact of the Marshall Plan on the machine tool business," he continued. "Your management has been keeping in close touch with the situation to be prepared to do whatever we may to supply our share of machine tools when the export market opens, but we have not been speculating on any large influx of orders as a result of ECA.

"Our overall backlog of orders, however, is slightly higher than at the beginning of the year, plant facilities have been maintained, certain old equipment has been replaced, and improvements that promise increased efficiency have been installed. To this end we have made capital expenditures during the year approximating \$700,000," Mr. Conard stated.

In Detroit, there are no significant changes in the machine tool market compared with reports received a week ago. No new firm

orders of consequence—although the number of requests for quotations continues at a high level. Pressures by purchasers to reduce prices are growing, it is reported. A flurry of excitement occurred here this week when it was reported that General Motors has agreed to build hydramatic transmissions for the Lincoln-Mercury Division. The report is unconfirmed.

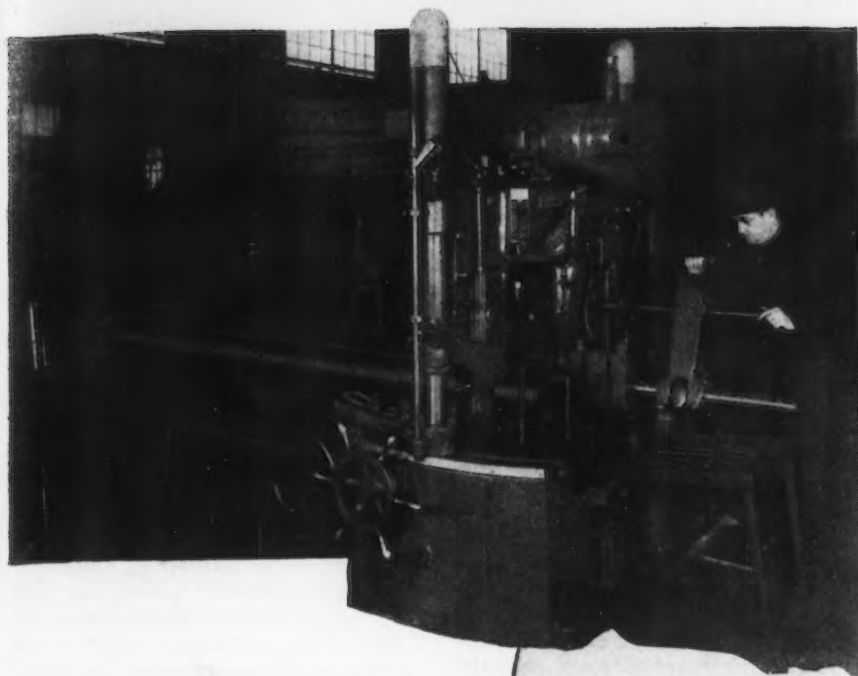
In its annual report this week, GM has indicated that machine tools and other equipment purchased during 1948 cost about two thirds more on the average than before the war.

In Washington, more than 200 executives of industrial firms are expected Apr. 4 for an Institute on the Economic Cooperation Administration, according to an announcement by Dr. Paul F. Douglas, president, American University, sponsor of the program. Scheduled for the entire week, the institute will be opened Apr. 4 with an address by ECA Administrator, Paul Hoffman. Director of the institute will be E. K. Gubin. Sessions will mark the first time that U. S. Government representatives and American business leaders will meet with representatives of foreign governments and discuss their mutual operation problems.

Discussion Leaders will be top members of the ECA staff and representatives of foreign countries receiving ECA aid. The week's program will be divided into two phases, a summary of Marshall Plan operations and needs of ECA countries and how they and their importers buy.

Elsewhere, it was reported in Amsterdam, Holland, this week, that a new metal drill manufacturing plant will be set up and an American company, Republic Drill & Tool Co., will supervise the installation of equipment and provide technical assistance.





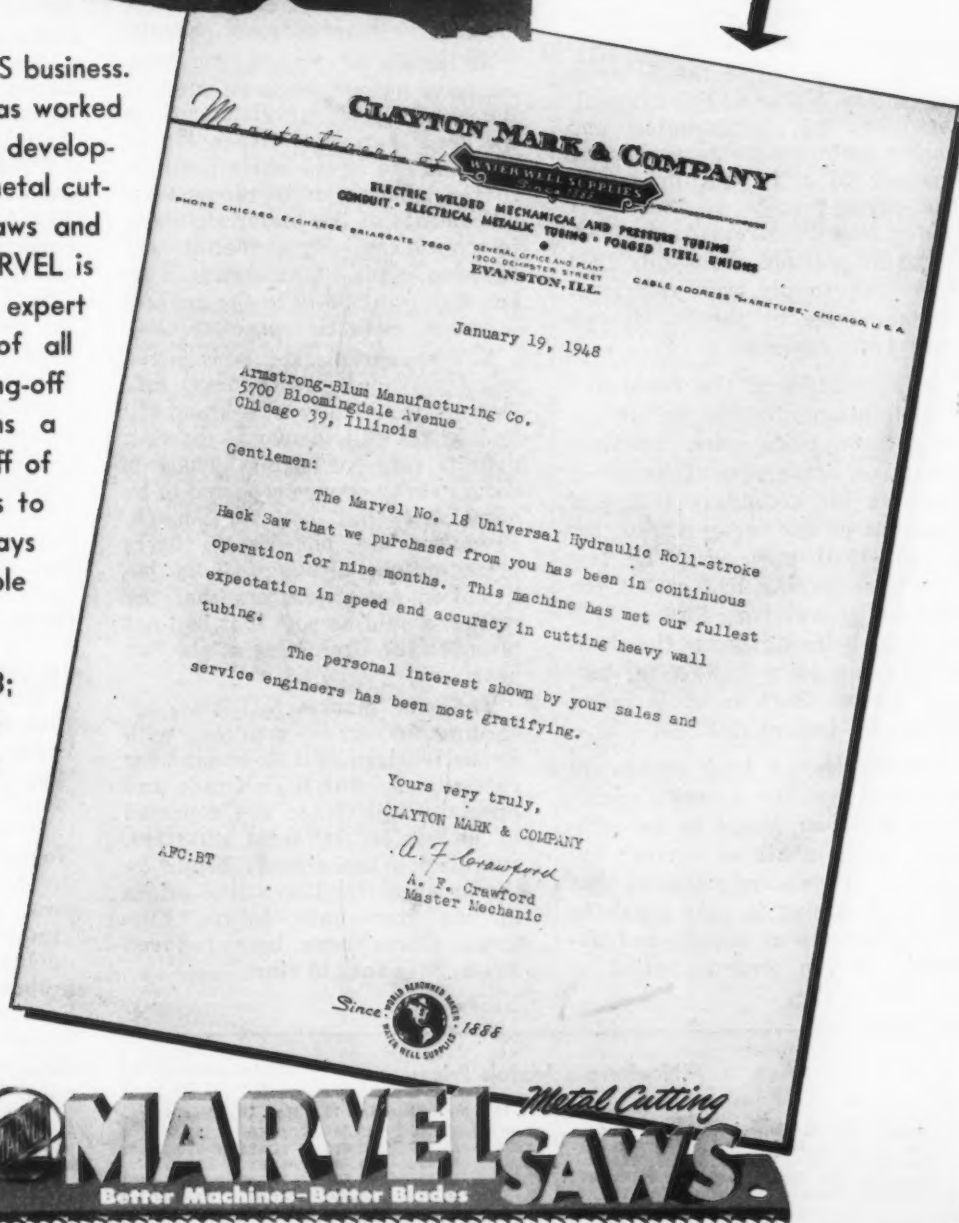
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# NONFERROUS METALS

... News and Market Activities

## Lead Price Cut an Additional 1½¢ per lb; Other Metals Weak

### New York

••• Another reduction in the price of lead was made by American Smelting & Refining Co. on Monday. The current reduction of 1½¢ brings the total reduction in the lead price in the last 2 weeks to 3.5¢ per lb. By Monday night other producers had not followed suit, but in the present market there is no doubt that their announcements will follow quickly.

It developed after the 2¢ price cut of Mar. 8 that additional business was not forthcoming and market factors were expecting the prospect of a further price cut. The current price of 18.00¢ for lead at New York returns the market to its position about July 1948 when the supply was restricted by the strike at the St. Joseph Lead Co. properties.

Many factors in the trade had already discounted the probability of further price cuts. Smelters found no improvement in their business for secondary lead and were out of the scrap market for all practical purposes. The few who were buying had raised the smelting charge from \$130 to \$150 per ton, bringing down the dealers' buying price to 6½¢ for battery plates. Soft scrap is being bought by dealers at 12½¢.

Inventories of lead consumers formerly good for a week's operations are now found to be sufficient for a month at current operations. Producers point out that the lead market is very sensitive to fluctuations of supply and demand. In the present period of

### American Smelting & Refining Co. Takes Lead In Second Cut Within 2 Weeks

o o o

inventory reductions and curtailed operations in the battery industry, the heaviest customer, the metal is very apt to react sharply.

So far the other nonferrous metals have not yet been affected by the recent price developments in the lead market. Neither copper nor zinc are in the same position, so far as drastically reduced requirements of the major customer is concerned. Both metals are showing signs of an easier market, due principally to the general inventory reduction practice.

The copper market is reported to be very quiet, with brass mill demand practically at a standstill and wire mill demand showing definite signs of easing. There is some nearby copper reported to be obtainable, but not very much. Producers do not expect early price action, although it is believed in some quarters that the market would be soft if it had not been for the Utah Mine strike last year.

The zinc market is spotty, according to trade sources, with Prime Western still in demand for galvanizing. But High Grade and Special High Grade are reported to be easier. In some quarters, speculation has already begun on the prospect for lower zinc prices in the immediate future. Zinc scrap prices have been reduced again, 8½¢ for old zinc.

At this time, the strategic stockpile does not serve to take surplus tonnages of metals, as it is understood that commitments for present funds have already been made, and the stockpiling extension bill for the next fiscal year has yet to be passed by congress.

Lead producers point out that every reduction in the price of the metal serves to shut down some mine operations. In many cases the closing of marginal mines is permanent as reopening is more costly than the reserves would warrant.

Production of refined copper in the United States in February was 80,275 net tons; deliveries to consumers, 98,611 tons, according to the Copper Institute. Both figures reflect slight improvements over the January low point. Domestic production of primary copper in February showed more significant improvement, 59,252 tons, compared with 53,066 tons in January. This figure probably includes some tonnage from the Utah mine now that the strike is over. Some factors believe that it may be June before this copper is obtained in volume from the refinery. Domestic refined stocks of copper were reduced by 7212 tons during the month to 83,841 tons.

World consumption of tin in 1948 is estimated by the International Tin Study Group at 138,000 long tons, compared with estimated production of tin in concentrate form of 152,500 tons. In November, world production of tin in concentrates reached 14,200 tons, reflecting a better rate of production by far eastern producing areas. Production of tin dropped to 12,600 tons in November from October's 14,100 tons. World stocks of tin are growing, 148,100 tons in October compared with 136,500 tons in September. World consumption of tin was only 11,200 tons in November, a 300-ton decline from the average monthly consumption of the first 10 months of the year.

Nonferrous Metals Prices

	Mar. 9	Mar. 10	Mar. 11	Mar. 12	Mar. 14	Mar. 15
Copper, electro, Conn .....	23.50	23.50	23.50	23.50	23.50	23.50
Copper, Lake, Conn. ....	23.625	23.625	23.625	23.625	23.625	23.625
Tin, Straits, New York .....	\$1.03	\$1.03	\$1.03	\$1.03	\$1.03	\$1.03
Zinc, East St. Louis .....	17.50	17.50	17.50	17.50	17.50	17.50
Lead, St. Louis .....	19.30	19.30	19.30	19.30	17.80	17.80



# NONFERROUS METALS PRICES

## Primary Metals

(Cents per lb, unless otherwise noted)

Aluminum, 99+%, 10,000 lb, freight allowed	17.00
Aluminum pig	16.00
Antimony, American, Laredo, Tex.	38.50
Beryllium copper, 3.75-4.25% Be	
dollars per lb contained Be	\$24.50
Beryllium aluminum 5% Be, dollars per lb contained Be	\$52.00
Cadmium, del'd	32.00
Cobalt, 97-99% (per lb)	\$1.65 to \$1.72
Copper, electro, Conn. Valley	23.50
Copper, lake, Conn. Valley	23.625
Gold, U. S. Treas., dollars per oz.	\$35.00
Iridium, 99.8%, dollars per troy oz.	\$22.25
Iridium, dollars per troy oz.	\$105 to \$110
Lead, St. Louis	17.80
Lead, New York	18.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex.	20.50
Magnesium, sticks, carlots	34.50
Mercury, dollars per 76-lb flask, f.o.b. New York	\$88 to \$94
Nickel, electro, f.o.b. New York	42.93
Palladium, dollars per troy oz.	\$24.00
Platinum, dollars per troy oz.	\$78 to \$81
Silver, New York, cents per oz.	71.50
Tin, Grade A, New York	\$1.03
Zinc, East St. Louis	17.50
Zinc, New York	18.198
Zirconium copper, 10-12 pct Zr, per lb contained Zr	\$12.00

## Remelted Metals

### Brass Ingot

(Published prices, cents per lb delivered, carloads)

85-5-5-5 ingot		
No. 115	17.50*	20.00
No. 120	17.00*	19.50
No. 123	16.50*	19.00
80-10-10 ingot		
No. 305	25.25	
No. 315	24.25	
88-10-2 ingot		
No. 210	32.50	
No. 215	29.50	
No. 245	21.00*	23.75
Yellow ingot		
No. 405	14.50*	17.00
Manganese bronze		
No. 421	22.50	
* F.o.b. Philadelphia.		

### Aluminum Ingot

(Cents per lb, lots of 30,000 lb)

95-5 aluminum-silicon alloys		
0.30 copper, max.	25.00-25.75	
0.60 copper, max.	24.75-25.25	
Piston alloys (No. 122 type)	21.25-22.00	
No. 12 alloy (No. 2 grade)	20.25-21.00	
108 alloy	21.25-21.75	
195 alloy	21.75-22.25	
13 alloy	24.75-25.75	
AXS-679	21.50-22.75	

### Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95 pct-95½ pct	22.50-23.00
Grade 2—92 pct-95 pct	20.75-21.25
Grade 3—90 pct-92 pct	20.50-21.00
Grade 4—85 pct-90 pct	20.25-20.75

## Electroplating Supplies

### Anodes

(Cents per lb, freight allowed, in 500 lb lots)

Copper	
Cast, oval, 15 in. or longer	40½
Electrodeposited	34½
Roller, oval, straight, delivered	37.34
Ball anodes	38½
Brass, 80-20	
Cast, oval, 15 in. or longer	35½
Zinc, oval, 99.99	
Ball anodes	20.50
Nickel 99 pct plus	
Cast	59.00
Roller, depolarized	60.00
Cadmium	\$2.10
Silver 999 fine, roller, 100 oz. lots, per troy oz, f.o.b. Bridgeport, Conn.	79

### Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	46.00
Copper sulfate, 99.5 crystals, bbls.	9.10
Nickel salts, single or double, 100 lb bags, frt. allowed	20.00
Nickel chloride, 300 lb bbl.	24.50
Silver cyanide, 100 oz. lots, per oz.	59
Sodium cyanide, 96 pct domestic 100 lb drums	16.00
Zinc sulfate, crystals, 22.5 pct, bags	
Zinc sulfate, 25 pct, granules, bbls, frt allowed	

## Mill Products

### Aluminum

(Base prices, cents per pound, base 30,000 lb, f.o.b. shipping point, freight allowed)

Flat Sheet: 0.188 in., 2S, 3S, 26.9¢; 4S, 61S-O, 28.8¢; 52S, 30.9¢; 24S-O, 24S-OAL, 29.8¢; 75S-O, 75S-OAL, 36.3¢; 0.081 in., 2S, 3S, 27.9¢; 4S, 61S-O, 30.2¢; 52S, 32.3¢; 24S-O, 24S-OAL, 30.9¢; 75S-O, 75S-OAL, 38¢; 0.032 in., 2S, 3S, 29.5¢; 4S, 61S-O, 33.5¢; 52S, 36.2¢; 24S-O, 24S-OAL, 37.9¢; 75S-O, 75S-OAL, 47.6¢.

Plate: ¼ in. and heavier: 2S, 3S, F, 23.8¢; 4S-F, 26¢; 52S-F, 27.1¢; 61S-O, 26.6¢; 24S-F, 24S-FAL, 27.1¢; 75S-F, 75S-FAL, 33.9¢.

Extruded Solid Shapes: Shape factors 1 to 4, 35.1¢ to 66¢; 11 to 13, 36.1¢ to 78¢; 23 to 25, 38.2¢ to \$1.07; 35 to 37, 45.7¢ to \$1.65; 47 to 49, 67.5¢ to \$2.41.

Rod, Rolled: 1.064 to 4.5 in., 2S-F, 3S-F, 34¢ to 30.5¢; Cold-finished, 0.375 to 3.5 in., 2S, 3S, 36.5¢ to 32¢.

Screw Machine Stock: Drawn, ¼ to 11/32 in., 11S-T3, R317-T4, 49¢ to 38¢; cold-finished, ¾ to 1½ in., 11S-T3, 37.5¢ to 35.5¢; ¾ to 2 in., R317-T4, 37.5¢ to 34.5¢; rolled, 19/16 to 3 in., 11S-T3, 35.5¢ to 32.5¢; 2½ to 3½ in., R317-T4, 33.5¢ to 32.5¢. Base 5000 lb.

Drawn Wire: Coiled, 0.051 to 0.374 in.: 2S, 36¢ to 25.5¢; 52S, 44¢ to 32¢; 61S, 47¢ to 38.5¢; 17S-T4, 50¢ to 34.5¢; 61S-T4, 44.5¢ to 34¢; 75S-T6, 76¢ to 55¢.

### Magnesium

(Cents per lb, f.o.b. mill, freight allowed Base quantity 30,000 lb)

Sheet and Plate: Ma, FSA, ¼ in., 54¢-56¢; 0.188 in., 56¢-58¢; B & S gage 3, 58¢-60¢; 10, 59¢-61¢; 12, 63¢-65¢; 14, 69¢-74¢; 16, 76¢-81¢; 18, 84¢-89¢; 20, 96¢-1.01; 22, \$1.22-\$1.31; 24, \$1.62-\$1.75. Specification grade higher.

Extruded Round Rod: M, diam. in., ¼ to 0.311, 58¢; ½ to ¾, 46¢; 1¼ to 1.749, 43¢; 2½ to 5, 41¢. Other alloys higher.

Extruded Square, Hex. Bar: M, size across flats, in., ¼ to 0.311, 61¢; ½ to 0.749, 48¢; 1¼ to 1.749, 44¢; 2½ to 4, 42¢. Other alloys higher.

Extruded Solid Shapes, Rectangles: M, in weight per ft, for perimeters of less than size indicated, 0.10 to 0.11 lb per ft, per. up to 3.5 in., 55¢; 0.22 to 0.25 lb per ft, per. up to 5.9 in., 51¢; 0.50 to 0.59 lb per ft, per. up to 8.6 in., 47¢; 1.8 to 2.59 lb per ft, per. up to 19.5 in., 44¢; 4 to 6 lb per ft, per. up to 28 in., 43¢. Other alloys higher.

Extruded Round Tubing: M, wall thickness, outside diam. in., 0.049 to 0.057, ¼ to 5/16, \$1.14; 5/16 to ¾, \$1.02; ¾ to 1, 76¢; 1 to 2 in., 65¢; 0.065 to 0.082, ¾ to 1 7/16, 85¢; ¾ to 1, 62¢; 1 to 2 in., 57¢; 0.165 to 0.219, ¾ to 1, 54.5¢; 1 to 2 in., 53¢; 3 to 4 in., 49¢. Other alloys higher.

### Nickel and Monel

(Base prices, cents per lb, f.o.b. mill)

	Nickel	Monel
Sheets, cold-rolled	60	47
Strip, cold-rolled	66	50
Rods and shapes		
Hot-rolled	56	45
Cold-drawn	56	45
Angles, hot-rolled	56	45
Plates	58	46
Seamless tubes	89	80
Shot and blocks		40

### Copper, Brass, Bronze

(Cents per pound, freight prepaid on 200 lb)

	Extruded Shapes	Rods	Sheets
Copper	36.78		37.18
Copper, hot-rolled		33.03	
Copper, drawn		34.28	
Low brass	38.57*	35.35	35.66
Yellow brass	37.60*	34.28	34.59
Red brass	38.92*	35.70	36.01
Naval brass	34.90	33.65	33.59
Leaded brass		29.24	
Commercial			
bronze	39.54*	36.57	36.88
Manganese bronze	38.49	36.99	43.09
Phosphor bronze, 5 pct	57.80*	56.30	56.05
Muntz metal	34.47	33.22	37.66
Everdur, Herculey, Olympic, etc.	40.49	40.76	41.82
Nickel silver, 10 pct		47.17	44.77
Architectural bronze	33.42		
* Seamless tubing.			

## Scrap Metals

### Brass Mill Scrap

(Cents per pound; add ¼¢ per lb for shipments of 20,000 lb or more)

	Heavy	Turn-ings
Copper	21½	20½
Yellow brass	18½	18½
Red brass	20	19½
Commercial bronze	20½	19½
Manganese bronze	18½	17½
Leaded brass rod ends	18½	

### Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper, wire	18.75
No. 2 copper, wire	17.75
Light copper	16.75
Refinery brass	16.50-16.75

### Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to producer)

No. 1 copper, wire	18.00-18.50
No. 2 copper, wire	17.00-17.50
Light copper	16.00-16.50
No. 1 composition	14.00-14.25
No. 1 comp. turnings	13.75-14.00
Roller brass	12.25-12.75
Brass pipe	12.25-13.75
Radiators	12.00-12.50
Heavy yellow brass	12.00-12.25

Mixed old cast	14.25-14.50
Mixed old clips	14.25-14.75
Mixed turnings, dry	13.50-13.75
Pots and pans	14.50-15.75
Low copper	17.75-18.25

### Dealers' Scrap

(Dealers' buying prices, f.o.b. New York in cents per pound)

	Copper and Brass
No 1 heavy copper and wire	17 — 17½
No 2 heavy copper and wire	16 — 16½
Light copper	15 — 15½
Auto radiators (unsweated)	10½ — 11
No. 1 composition	12 — 12½
No. 1 composition turnings	11½ — 12½
Clean red car boxes	10½ — 10½
Cocks and faucets	10½ — 10½
Mixed heavy yellow brass	7½ — 8
Old roller brass	10½ — 11
Brass pipe	11 — 11½
New soft brass clippings	15 — 15½
Brass rod ends	11½ — 12
No. 1 brass rod turnings	8½ — 9

### Aluminum

Alum. pistons and struts	5 — 5½
Aluminum crankcases	8 — 8½
2S aluminum clippings	13 — 13½
Old sheet and utensils	8 — 8½
Borings and turnings	4½ — 5
Misc. cast aluminum	8 — 8½
Dural Clips (24S)	8 — 8½

### Zinc

New zinc clippings	10½ — 11
Old zinc	8 — 8½
Zinc routings	5 — 5½
Old die cast scrap	5 — 5½

### Nickel and Monel

Pure nickel clippings	22 — 23
Clean nickel turnings	17 — 18
Nickel anodes	22 — 23
Nickel rod ends	21 — 22
New Monel clippings	16½ — 17½
Clean Monel turnings	11 — 12
Old sheet Monel	13 — 14
Old Monel castings	11 — 12
Inconel clippings	13 — 14
Nickel silver clippings, mixed	8 — 8½
Nickel silver turnings, mixed	7 — 7½

### Lead






Soft scrap lead	12 — 12½
Battery plates (dry)	6 — 6½

### Magnesium Alloys

Segregated solids	8 — 9
Castings	4½ — 5½

### Miscellaneous

Block tin	82 — 84
No. 1 pewter	65 — 67
No. 1 auto babbitt	51 — 53
Mixed common babbitt	14 — 14½
Solder joints	20 — 21
Siphon tops	50 — 52
Small foundry type	15½ — 16
Monotype	14½ — 15
Lino. and stereotype	14 — 14½
Electrotype	12½ — 13
New type shell cuttings	15 — 15½
Hand picked type shells	6 — 6½
Lino. and stereo. dross	8½ — 9
Electro. dross	6 — 6½

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# SCRAP

... News and Market Activities

## Prices Slip; Market Wobbly; Sales Lag

### New York

••• Many in the scrap trade this week are wondering how low scrap prices can go. In no area can it be said that the market has stabilized. In every area scrap prices on some items slipped further. In some areas lower prices were recorded for nearly every item.

Philadelphia was hardest hit this week. Orders placed at sharply lower prices were for small tonnages but they constitute the bulk of current activity. In this area No. 1 melting was down \$2 a gross ton, No. 2 melting was down \$3, No. 2 bundles were down \$4, and turnings were down \$7 to \$10.

The decrease at Philadelphia caused THE IRON AGE scrap composite to drop 67¢ a gross ton to \$35.58 a gross ton. The market at Pittsburgh is uncertain and weak. In this area the trend is still down. In Chicago first strength in many weeks appeared—in railroad specialties. But this—encouraging as it may be—cannot be accepted as a trend.

Other areas reflect an absence of buying, even at lower prices. Major consumers are generally still out of the market. Small, spot orders are being placed in all districts. But nowhere is there a stampede to buy—even at the lowest prices since the middle of 1947. This week it is evident that no one wants a good-sized bite of today's market.

Movement is good where brokers and dealers still have orders to fill. Most old business has been cleaned up. There are two big unanswered questions in the trade this week: (1) How low can scrap go? (2) When will new business be booked on a large scale?

• PITTSBURGH—The market had a tone of uncertain weakness about it this week on the openhearth tonnage items. Though dealers were still seeking an order for shovelling turnings at the beginning of the week the crushers raised their buying price from the \$23 distress level prevailing last week. A sale of a substantial tonnage of genuine low phos sent this quotation down sharply to \$39 to \$39.50. No. 2 bundles could be bought this week at \$2 less than the price of No. 2 steel

though buyers are talking about making the differential \$3. A few cars of No. 2 steel were bought early in the week to deliver in the district at \$34.50 but neither brokers nor dealers are talking figures in their frequent new business calls on buyers.

• CHICAGO — Last week saw a little strength in some items for the first time since the market broke last December. These items are railroad specialties are not major items, and cannot in any way be indicative of a general trend. However, the fact that some prices showed strength is news. Generally openhearth scrap drifted along. The market was extremely quiet last week. Many in the trade can't understand what keeps the prices from tumbling further. The dealers may have the answer. They say that scrap shipments into their yards have dwindled to practically nothing. A typographical error occurred in last week's report of bundled machine shop turnings. The price should have read \$26 to \$27.

• PHILADELPHIA — New orders were placed early this week for major scrap grades at prices sharply below former quotations. These orders were for small tonnages but they constitute the bulk of current market activity. No. 1 melting was down \$2. No. 2 melting was down \$3. No. 2 bundles were down \$4. Turnings were down \$7 to \$10, a price spread having developed between machine shop and mixed borings and turnings. Cast grades are down by \$2 to \$4. Low phos grades are down \$1. Rail specialties are down by \$11. The heavy declines in prices were caused by the nominal nature of the previous quotations, reflecting the long absence of new buying to establish the market.

• CLEVELAND—Despite the coal tie-up, progressive weakening in price, on appraisal, continued here and in the Valley this week. Most consumers in this area are out of the market for March, and one major consumer continues to hold up shipments to Valley plants. Rumor has it that one Valley mill will buy this week, but otherwise new orders are pretty scarce. Present evidence indicates that the market may have some distance to go before the bottom price-wise is reached. On the other hand, a Dept. of Commerce proposal that scrap be stockpiled, scheduled for munitions board consideration this week, might change the price trend if approved.

• DETROIT—With practically a complete absence of buying here in all scrap grades, the market continues its downward slip. However, determination of today's scrap prices is made extremely difficult by the presently badly confused situation which, as some observers have pointed out, could change abruptly if scrap buyers were suddenly to decide to take even small tonnages at a steady pace. Weakest spots in the market are turnings and cast grades. The latter

price has now hit a level that is little more than half the peak price for the postwar period.

• CINCINNATI — Trade sources anticipate little change in the market here from its present immobilized condition during the balance of this month. Orders are out that will keep a nominal amount of material moving, but otherwise, the market is very quiet. Mills and foundries are out of the market, coal stoppage to the contrary, but there are signs that foundry consumers may begin holding up scrap shipments because of an anticipated lack of coke.

• NEW YORK—This scrap market is in worse condition than it has been for many months. Consumers were not tempted by last week's lower prices, so they have tumbled again. Generally, openhearth grades are a dollar lower, blast furnace grades are \$2 to \$4 lower and cast grades are \$3 lower. Even at these drastically low prices (compared to a few months ago), consumers are not buying. Brokers report a few spot sales being made, but no big tonnage is being booked. Movement is good for those who still have old orders to fill. But this business is about cleaned up.

• BOSTON—Most prices in this area are about \$1 lower this week. But very little tonnage is being sold. Brokers who have been expecting new business to be placed are at a loss to explain the lack of activity. Feeling here is that prices can't go much lower than they are now.

• BIRMINGHAM—An already slow market here has been made slower by uncertainty over the intentions of John L. Lewis. Prospective purchasers are reluctant to place orders until they know whether the miners will return to work at the end of 2 weeks. Meanwhile dealers in this district report a drop in inventories on their yards despite relatively slow movement of scrap to consumers since the first of the year. Peddlers are finding other activity more profitable since the price decline began and dealers have hesitated to buy heavily in the fear that they would be caught by more price drops.

• BUFFALO—More of the gold plate was rubbed off steelmaking scrap this week and the market had a definitely tarnished look. Jittery dealers with few or no orders to speak of sliced prices \$2 to \$3 down the line and wondered where they would go with their scrap while the mills sat tight. Adding to the gloom were the prospects of an early opening of navigation on the lakes and in the canal. A 5000-ton cargo is booked for lake shipment from Detroit to a leading local consumer for next week and the canal opening has been tentatively set for Apr. 4. Examples of the latest prices were No. 1 steel \$35-36, No. 2 steel \$30-31, No. 2 bundles \$27-28, machine shop turnings \$22-23 and low phos plate \$38-39. Railroad specialties were no exception to the weakness, but cast grades were nominally unchanged, probably because interest price-wise was centered in steel.

# IRON AND STEEL SCRAP PRICES

## PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$36.50 to \$37.00
RR. hvy. melting	39.00 to 39.50
No. 2 hvy. melting	34.50 to 35.00
No. 2 bundles	32.50 to 33.00
RR. scrap rails	40.00 to 41.00
Rails 2 ft and under	47.00 to 48.00
No. 1 comp'd bundles	36.50 to 37.00
Hand bld. new shfs.	36.50 to 37.00
Hvy. steel forge turn.	34.50 to 35.00
Mach. shop turn.	25.00 to 26.00
Shoveling turn.	27.00 to 28.00
Mixed bor. and turn.	25.00 to 26.00
Cast iron borings	27.00 to 28.00
No. 1 mach. cast.	43.00 to 44.00
Mixed yard cast.	37.00 to 38.00
Hvy. breakable cast.	34.00 to 35.00
Malleable	47.00 to 48.00
RR. knuck. and cup.	42.50 to 45.00
RR. coil springs	44.50 to 45.50
RR. leaf springs	44.50 to 45.50
Roller steel wheels	42.50 to 45.00
Low phos.	39.00 to 39.50

## CHICAGO

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$34.00 to \$35.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 bundles	34.00 to 35.00
No. 2 dealers' bundles	29.00 to 30.00
Bundled mach. shop turn.	26.00 to 27.00
Galv. bundles	26.00 to 27.00
Mach. shop turn.	21.00 to 23.00
Short shov. turn.	21.00 to 23.00
Cast iron borings	21.00 to 23.00
Mix. borings and turn.	21.00 to 23.00
Low phos. hvy. forge	40.00 to 41.00
Low phos. plates	37.00 to 39.00
No. 1 RR. hvy. melt.	36.00 to 37.75
Rerolling rails	43.25 to 47.00
Miscellaneous rails	39.00 to 41.75
Angles & splice bars	40.00 to 41.00
Locomotive tires, cut.	42.00 to 43.00
Cut bolster & side frames	39.00 to 40.00
Standard stl. car axles	56.00 to 58.00
No. 3 steel wheels	41.00 to 42.00
Couplers and knuckles	41.00 to 41.75
Rails 3 ft and under	42.00 to 44.00
Malleable	38.00 to 39.00
No. 1 mach. cast.	41.00 to 42.00
No. 1 agricul. cast.	38.00 to 40.00
Heavy breakable cast	35.00 to 38.00
RR. grate bars	29.00 to 30.00
Cast iron brake shoes	30.00 to 35.00
Cast iron car wheels	40.00 to 42.00

## CINCINNATI

Per gross ton, f.o.b. cars:

No. 1 hvy. melting	\$30.00 to \$31.00
No. 2 hvy. melting	27.00 to 28.00
No. 1 bundles	30.00 to 31.00
No. 2 bundles	28.00 to 29.00
Mach. shop turn.	20.00 to 21.00
Shoveling turn.	21.00 to 22.00
Cast iron borings	21.00 to 22.00
Mixed bor. & turn.	21.00 to 22.00
Low phos. 18 in. under	37.00 to 38.00
No. 1 cupola cast.	40.00 to 42.00
Hvy. beakable cast.	34.00 to 36.00
Rails 18 in. and under	44.50 to 46.50
Rails random length	36.00 to 38.00
Drop broken	44.00 to 45.00

## BOSTON

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	\$28.00 to \$29.00
No. 2 hvy. melting	23.50 to 24.00
No. 1 bundles	26.50 to 27.00
No. 2 bundles	22.00 to 23.50
Bushelings	23.50 to 24.00
Shoveling turn.	21.50 to 22.00
Machine shop turn.	19.50 to 20.00
Mixed bor. and turn.	19.50 to 20.00
C'n cast chem. bor.	28.50 to 29.50
No. 1 machinery cast.	33.50 to 34.50
No. 2 machinery cast.	30.50 to 32.50
Heavy breakable cast.	27.50 to 29.00
Stove plate	27.50 to 29.00

## DETROIT

Per gross ton, brokers' buying prices f.o.b. cars:

No. 1 hvy. melting	\$29.00 to \$30.00
No. 2 hvy. melting	27.00 to 28.00
No. 1 bundles	32.00 to 33.00
New busheling	29.00 to 30.00
Flashings	29.00 to 30.00
Mach. shop turn.	18.00 to 19.00
Machinery cast.	36.00 to 37.00
Mixed yard cast.	35.00 to 36.00
Shoveling turn.	19.00 to 20.00
Cast iron borings	18.00 to 19.00
Mixed bor. & turn.	18.00 to 19.00
Low phos. plate	33.00 to 34.00
Heavy breakable cast.	31.00 to 32.00
Stove plate	33.00 to 34.00
Automotive cast.	36.00 to 37.00

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages.

## PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$35.00 to \$36.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 bundles	35.00 to 36.00
No. 2 bundles	27.00 to 27.50
Mach. shop turn.	22.00 to 23.00
Shoveling turn.	27.00 to 28.00
Mixed bor. and turn.	19.00 to 20.00
Clean cast chemical bor.	33.00 to 36.00
No. 1 machinery cast.	39.00 to 41.00
No. 1 mixed yard cast	37.00 to 38.00
Hvy. breakable cast.	35.00 to 36.00
Hvy. axle forge turn.	35.00 to 36.00
Low phos. acid openhearth	39.00 to 40.00
Low phos. electric furnace	39.00 to 40.00
Low phos. bundles	37.00 to 38.00
RR. steel wheels	31.00 to 32.00
RR. coil springs	31.00 to 32.00
RR. malleable	36.00 to 38.00
Cast iron carwheels	39.00 to 40.00

## ST. LOUIS

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$33.00 to \$34.00
No. 2 hvy. melting	29.00 to 30.00
Bundled sheets	28.00 to 29.00
Mach. shop turn.	20.00 to 22.00
Shoveling turnings	20.00 to 22.00
Locomotive tires, uncut	38.00 to 39.00
Mis. std. sec. rails	34.00 to 35.00
Steel angle bars	39.00 to 40.00
Rails 3 ft. and under	43.00 to 45.00
RR. steel springs	40.00 to 41.00
Steel car axles	50.00 to 51.00
Brake shoes	30.00 to 31.00
Malleable	34.00 to 35.00
Cast iron car wheels	40.00 to 41.00
No. 1 machinery cast.	40.00 to 41.00
Hvy. breakable cast.	33.00 to 34.00

## BIRMINGHAM

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$29.00
No. 2 hvy. melting	29.00
No. 2 bundles	27.00
No. 1 busheling	29.00
Long turnings	22.00
Shoveling turnings	24.00
Cast iron borings	24.00
Bar crops and plate	\$35.00 to 37.00
Structural and plate	35.00 to 37.00
No. 1 cupola cast.	41.00 to 42.00
Stove plate	38.00 to 39.00
No. 1 RR. hvy. melt.	32.50 to 34.00
Steel axles	45.00 to 47.00
Scrap rails	37.00 to 38.00
Rerolling rails	41.00 to 43.00
Angles & splice bars	40.00 to 42.00
Rails 3 ft & under	40.00 to 42.00
Cast iron carwheels	39.00 to 40.00

## YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$35.50 to \$36.00
No. 2 hvy. melting	34.50 to 35.00
No. 1 bundles	35.00 to 36.00
No. 2 bundles	33.00 to 34.00
Mach. shop turn.	25.00 to 26.00
Short shov. turn.	26.00 to 27.00
Cast iron borings	25.00 to 26.00
Low phos.	39.00 to 40.00

## NEW YORK

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	\$27.00 to \$28.00
No. 2 hvy. melting	24.00 to 25.00
No. 2 bundles	23.00 to 24.50
Mach. shop turn.	15.00 to 16.00
Mixed bor. & turn.	13.00 to 15.00
Shoveling turnings	19.00 to 20.00
Machinery cast.	32.00 to 33.00
Mixed yard cast.	30.00 to 32.00
Heavy breakable cast.	28.00 to 29.00
Charging box cast	28.00 to 29.00
Unstrp. motor blks.	27.00 to 28.00
C'n cast chem. bor.	29.50 to 30.50

## BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$35.00 to \$36.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 bundles	30.00 to 31.00
No. 2 bundles	27.00 to 28.00
No. 1 busheling	30.00 to 31.00
Mach. shop turn.	22.00 to 23.00
Shoveling turn.	24.00 to 25.00
Cast iron borings	22.00 to 23.00
Mixed bor. and turn.	22.00 to 23.00
Clean auto. cast.	42.00 to 44.00
Mixed yard cast.	34.00 to 35.00
Stove plate	34.00 to 35.00
RR. malleable	34.00 to 37.00
Small indus. malleable	34.00 to 35.00
Low phos. plate	38.00 to 39.00
Scrap rails	42.00 to 43.00
Rails 3 ft & under	46.00 to 47.00
RR. steel wheels	42.00 to 43.00
RR. coil & leaf spgs.	42.00 to 43.00
RR. knuckles & coup.	42.00 to 43.00

## CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$34.50 to \$35.00
No. 2 hvy. melting	33.50 to 34.00
No. 1 bundles	33.50 to 34.00
No. 2 bundles	32.00 to 33.00
No. 1 busheling	33.50 to 34.00
Drop forge flashings	33.50 to 34.00
Mach. shop turn.	23.00 to 23.50
Shoveling turn.	24.00 to 25.00
Steel axle turn.	31.00 to 31.50
Cast iron borings	23.00 to 24.00
Mixed bor. & turn.	22.00 to 23.00
Low phos. 2 ft and under	39.00 to 40.00
No. 1 mach. cast.	43.00 to 44.00
Malleable	40.00 to 41.00
RR. cast	43.00 to 44.00
Railroad grate bars	38.00 to 39.00
Stove plate	38.00 to 39.00
RR. hvy. melting	39.00 to 39.50
Rails 3 ft and under	46.00 to 48.00
Rails 18 in. and under	47.00 to 49.00

## SAN FRANCISCO

Per gross ton, f.o.b. shipping point:

No. 1 hvy. melting	\$25.00
No. 2 hvy. melting	25.00
No. 1 bales	23.00
No. 2 bales	23.00
No. 3 bales	20.00
Mach. shop turn.	15.00
Elec. fur. 1 ft under	\$37.50 to 40.00
No. 1 cupola cast.	38.00 to 42.00
RR. hvy. melting	25.00
Rails	25.00

## LOS ANGELES

Per gross ton, f.o.b. shipping point:

No. 1 hvy. melting	\$25.00
No. 2 hvy. melting	25.00
No. 1 bales	23.00
No. 2 bales	23.00
No. 3 bales	20.00
Mach. shop turn.	15.00
Elec. fur. 1 ft. under	\$32.00 to 38.00
No. 1 cupola cast.	38.00 to 42.00
RR. hvy. melting	25.00

## SEATTLE

Per gross ton delivered to consumer:

No. 1 & No. 2 hvy. melt.	\$25.00
No. 1 & No. 2 bales	23.00
No. 3 bales	23.00
Elec. fur. 1 ft. and under	36.00
No. 1 cupola cast.	\$40.00 to 45.00
RR. hvy. melting	25.00

## HAMILTON, ONT.

Per gross ton delivered to consumer: Cast grades f.o.b. shipping point:

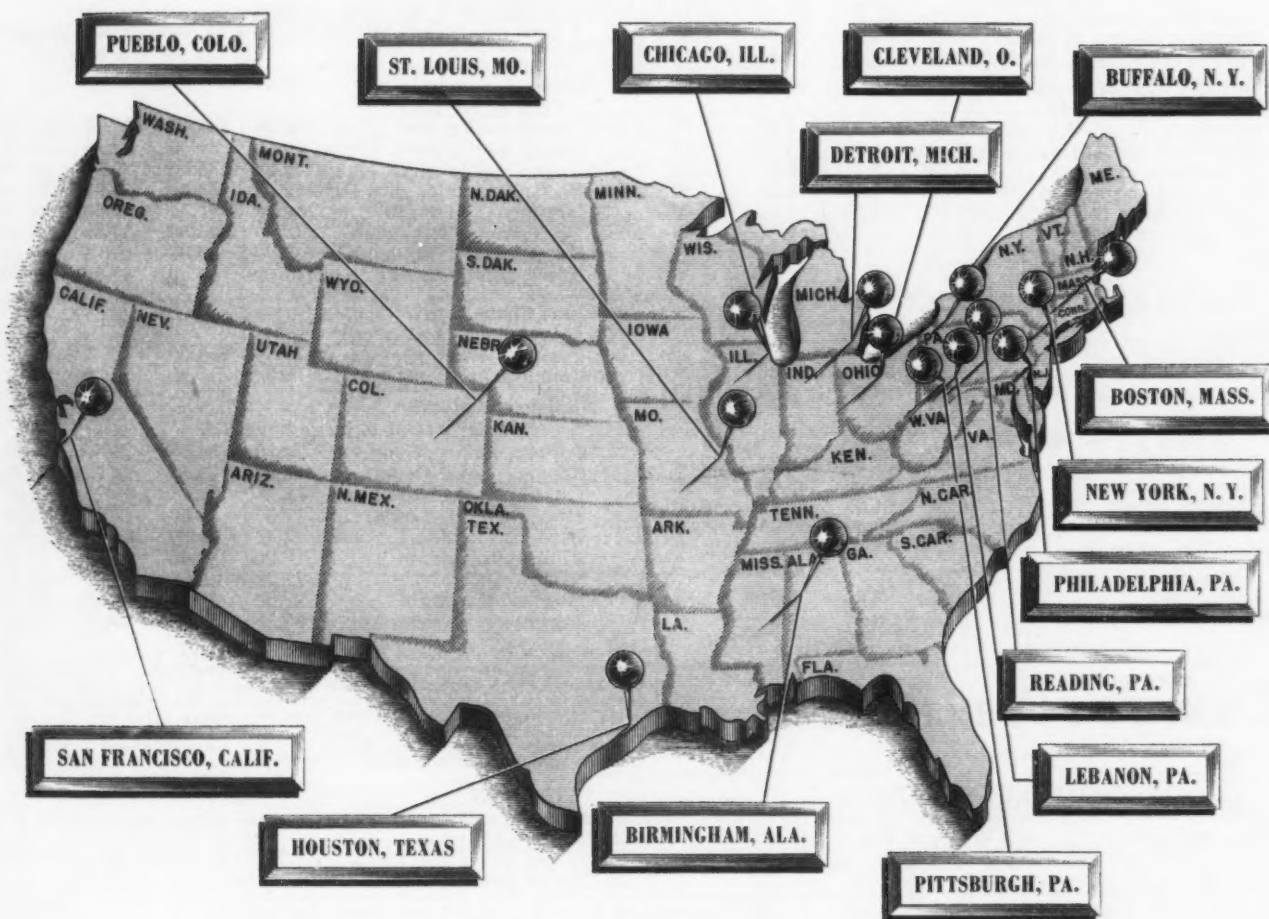
Heavy melting	\$23.00*
No. 1 bundles	23.00*
No. 2 bundles	22.50*
Mechanical bundles	21.00*
Mixed steel scrap	19.00*
Mixed borings and turnings	17.00*
Rails, remelting	23.00*
Rails, rerolling	26.00*
Bushelings	17.50*
Bushelings, new fact, prop'd	21.00*
Bushelings, new fact, unprop'd.	16.00*
Short steel turnings	17.00*
No. 1 cast.	\$48.00 to 50.00*
No. 2 cast.	44.00 to 45.00*

\*Ceiling Price.



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**LEADERS IN IRON AND STEEL SCRAP SINCE 1889**

# Comparison of Prices . .

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Flat-Rolled Steel:	Mar. 15, 1949	Mar. 8, 1949	Feb. 15, 1949	Mar. 16, 1948
(cents per pound)	1949	1949	1949	1948
Hot-rolled sheets	3.26	3.26	3.26	2.80
Cold-rolled sheets	4.00	4.00	4.00	3.55
Galvanized sheets (10 ga)	4.40	4.40	4.40	3.95
Hot-rolled strip	3.265	3.265	3.265	2.80
Cold-rolled strip	4.063	4.063	4.063	3.55
Plates	3.42	3.42	3.42	2.95
Plates wrought iron	7.85	7.85	7.85	7.25
Stains C-R strip (No. 302)	33.25	33.25	33.25	30.50

Tin and Terneplate:	Mar. 15, 1949	Mar. 8, 1949	Feb. 15, 1949	Mar. 16, 1948
(dollars per base box)				
Tinplate (1.50 lb) cokes	\$7.75	\$7.75	\$7.75	\$6.80
Tinplate, electro (0.50 lb)	6.70	6.70	6.70	6.00
Special coated mfg. ternes	6.65	6.65	6.65	5.90

Bars and Shapes:	Mar. 15, 1949	Mar. 8, 1949	Feb. 15, 1949	Mar. 16, 1948
(cents per pound)				
Merchant bars	3.37	3.37	3.37	2.90
Cold-finished bars	3.995	3.995	3.995	3.55
Alloy bars	3.75	3.75	3.75	3.30
Structural shapes	3.25	3.25	3.25	2.80
Stainless bars (No. 302)	28.50	28.50	28.50	26.00
Wrought iron bars	9.50	9.50	9.50	8.65

Wire:	Mar. 15, 1949	Mar. 8, 1949	Feb. 15, 1949	Mar. 16, 1948
(cents per pound)				
Bright wire	4.15	4.194	4.256	3.55

Rails:	Mar. 15, 1949	Mar. 8, 1949	Feb. 15, 1949	Mar. 16, 1948
(dollars per 100 lb)				
Heavy rails	\$3.20	\$3.20	\$3.20	\$2.75
Light rails	3.55	3.55	3.55	3.10

Semifinished Steel:	Mar. 15, 1949	Mar. 8, 1949	Feb. 15, 1949	Mar. 16, 1948
(dollars per net ton)				
Rerolling billets	\$52.00	\$52.00	\$52.00	\$45.00
Slabs, rerolling	52.00	52.00	52.00	45.00
Forging billets	61.00	61.00	61.00	54.00
Alloy blooms, billets, slabs	63.00	63.00	63.00	66.00

Wire rod and Skelp:	Mar. 15, 1949	Mar. 8, 1949	Feb. 15, 1949	Mar. 16, 1948
(cents per pound)				
Wire rods	3.619	3.619	3.619	2.80
Skelp	3.25	3.25	3.25	2.90

Pig Iron:	Mar. 15, 1949	Mar. 8, 1949	Feb. 15, 1949	Mar. 16, 1948
(per gross ton)	1949	1949	1949	1948
No. 2, foundry, Phila.	\$51.56	\$51.56	\$51.56	\$44.61
No. 2, Valley furnace	46.50	46.50	46.50	39.50
No. 2, Southern Cin'ti*	49.46	49.46	49.46	43.28
No. 2, Birmingham	43.38	43.38	43.38	37.38
No. 2, foundry, Chicago†	46.00	46.00	46.00	39.00
Basic del'd Philadelphia*	50.76	50.76	50.76	44.11
Basic, Valley furnace	46.00	46.00	46.00	39.00
Malleable, Chicago†	46.50	46.50	46.50	39.50
Malleable, Valley	46.50	46.50	46.50	39.50
Charcoal, Chicago	73.78	73.78	73.78	62.46
Ferromanganese†	161.40	161.40	161.40	145.00

† The switching charge for delivery to foundries in the Chicago district is \$1 per ton.  
 † Average of U. S. prices quoted on Ferroalloy page.  
 \* Does not include interim increase on total freight charges, effective Jan. 11, 1949.

Scrap	Mar. 15, 1949	Mar. 8, 1949	Feb. 15, 1949	Mar. 16, 1948
(per gross ton)				
Heavy melt'g steel, P'gh.	\$36.75	\$36.75	\$38.75	\$40.25
Heavy melt'g steel, Phila.	35.50	37.50	39.50	40.00
Heavy melt'g steel, Ch'go	34.50	34.50	34.50	39.00
No. 1, hy. comp. sh't, Det.	32.50	33.00	32.50	35.50
Low phos. Young'n.	39.50	41.50	45.25	45.25
No. 1, cast, Pittsburgh	43.50	45.50	57.50	61.00
No. 1, cast, Philadelphia	40.00	42.00	46.00	65.50
No. 1, cast, Chicago	41.50	41.50	42.00	69.00

Coke, Connellsville:	Mar. 15, 1949	Mar. 8, 1949	Feb. 15, 1949	Mar. 16, 1948
(per net ton at oven)				
Furnace coke, prompt	\$14.50	\$14.50	\$15.25	\$12.50
Foundry coke, prompt	16.50	16.50	16.75	14.00

Nonferrous Metals:	Mar. 15, 1949	Mar. 8, 1949	Feb. 15, 1949	Mar. 16, 1948
(cents per pound to large buyers)				
Copper, electro, Conn.	23.50	23.50	23.50	21.50
Copper, Lake Conn.	23.625	23.625	23.625	21.625
Tin, Grade A, New York	\$1.03	\$1.03	\$1.03	94.00
Zinc, East St. Louis	17.50	17.50	17.50	12.00
Lead, St. Louis	17.80	19.30	21.30	14.80
Aluminum, virgin	17.00	17.00	17.00	15.00
Nickel, electrolytic	42.93	42.93	42.90	36.56
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	38.50	38.50	38.50	33.00

Starting with the issue of Apr. 22, 1943, the weighted finished steel index was revised for the years 1941, 1942, and 1943. See explanation of the change on p. 90 of the Apr. 22, 1943, issue. Index revised to a quarterly basis as of Nov. 16, 1944; for details see p. 98 of that issue. The finished steel composite price for the current quarter is an estimate based on finished steel shipments for the previous quarter. This figure will be revised when shipments for this quarter are compiled.

# Composite Prices . .

FINISHED STEEL (Base Price)	
Mar. 15, 1949	3.75198¢ per lb.
One week ago	3.75434¢ per lb.
One month ago	3.75434¢ per lb.
One year ago	3.27585¢ per lb.

PIG IRON		SCRAP STEEL	
Mar. 15, 1949	\$46.74 per gross ton	Mar. 15, 1949	\$35.58 per gross ton
One week ago	\$46.74 per gross ton	One week ago	\$36.25 per gross ton
One month ago	\$46.74 per gross ton	One month ago	\$37.58 per gross ton
One year ago	\$40.29 per gross ton	One year ago	\$39.75 per gross ton

HIGH		LOW	
1949....	3.75628¢ Jan. 1	3.75198¢ Mar. 15	
1948....	3.75700¢ July 27	3.22566¢ Jan. 1	
1947....	3.19541¢ Oct. 7	2.87118¢ Jan. 7	
1946....	2.83599¢ Dec. 31	2.54490¢ Jan. 1	
1945....	2.44104¢ Oct. 2	2.54490¢ Jan. 2	
1944....	2.30837¢ Sept. 5	2.21189¢ Oct. 5	
1943....	2.29176¢	2.29176¢	
1942....	2.28249¢	2.28249¢	
1941....	2.43078¢	2.43078¢	
1940....	2.30467¢ Jan. 2	2.24107¢ Apr. 16	
1939....	2.35367¢ Jan. 3	2.26689¢ May 16	
1938....	2.58414¢ Jan. 4	2.27207¢ Oct. 18	
1937....	2.58414¢ Mar. 9	2.32263¢ Jan. 4	
1936....	2.32263¢ Dec. 28	2.05200¢ Mar. 10	
1935....	2.07642¢ Oct. 1	2.06492¢ Jan. 8	
1934....	2.15367¢ Apr. 24	1.95757¢ Jan. 2	
1933....	1.95578¢ Oct. 3	1.75836¢ May 2	
1932....	1.89196¢ July 5	1.83901¢ Mar. 1	
1931....	1.99626¢ Jan. 13	1.86586¢ Dec. 29	
1929....	2.31773¢ May 28	2.26498¢ Oct. 29	

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing major portion of finished steel shipments. Index recapitulated in Aug. 28, 1941, issue.

HIGH		LOW	
Mar. 15, 1949	\$46.82 Jan. 4	\$46.74 Jan. 25	
46.91 Oct. 12	39.58 Jan. 6		
37.98 Dec. 30	30.14 Jan. 7		
30.14 Dec. 10	25.37 Jan. 1		
25.37 Oct. 23	23.61 Jan. 2		
\$23.61	\$23.61		
23.61	23.61		
23.61	23.61		
\$23.61 Mar. 20	\$23.45 Jan. 2		
23.45 Dec. 23	22.61 Jan. 2		
22.61 Sept. 19	20.61 Sept. 12		
23.25 June 21	19.61 July 6		
23.25 Mar. 9	20.25 Feb. 16		
19.74 Nov. 24	18.73 Aug. 11		
18.84 Nov. 5	17.83 May 14		
17.90 May 1	16.90 Jan. 27		
16.90 Dec. 5	13.56 Jan. 3		
14.81 Jan. 5	13.56 Dec. 6		
15.90 Jan. 6	14.79 Dec. 15		
18.71 May 14	18.21 Dec. 17		

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

HIGH		LOW	
Mar. 15, 1949	\$43.00 Jan. 1	\$35.58 Mar. 15	
43.16 July 27	39.75 Mar. 9		
42.58 Oct. 28	29.50 May 20		
31.17 Dec. 24	19.17 Jan. 1		
19.17 Jan. 2	18.92 May 22		
19.17 Jan. 11	15.76 Oct. 24		
\$19.17	\$19.17		
19.17	19.17		
\$22.00 Jan. 7	\$19.17 Apr. 10		
21.83 Dec. 30	16.04 Apr. 9		
22.50 Oct. 3	14.08 May 16		
15.00 Nov. 22	11.00 June 7		
21.92 Mar. 30	12.67 June 9		
17.75 Dec. 21	12.67 June 8		
13.42 Dec. 10	10.33 Apr. 29		
13.00 Mar. 13	9.50 Sept. 25		
12.25 Aug. 8	6.75 Jan. 3		
8.50 Jan. 12	6.43 July 5		
11.33 Jan. 6	8.50 Dec. 29		
17.58 Jan. 29	14.08 Dec. 8		

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.



# Iron and Steel Prices . . .

Steel prices shown here are f.o.b. producing points in cents per pound unless otherwise indicated. Extras apply. (1) Commercial quality sheet grade; prices, 0.25¢ above base. (2) Commercial quality grade. (3) Widths up to 12-in. inclusive. (4) 0.25 carbon and less. (5) Cokes, 1.25 lb, deduct 25¢ per base box. (6) 18 gage and heavier. (7) For straight length material only from producers to fabricators. (8) Also shafting. For quantities of 40,000 lb and over. (9) Carload lot in manufacturing trade. (10) Hollowware enameling, gages 29 to 31 only. (11) Produced to dimensional tolerances in AISI Manual Sec. 6. (12) Slab prices subject to negotiation in most cases. (13) San Francisco only. (14) Los Angeles only. (15) San Francisco and Los Angeles only. (16) Seattle only. (17) Seattle and Los Angeles only.

PRODUCTS	Base prices at producing points apply to the sizes and grades produced in these areas														
	Pitts- burgh	Chicago	Gary	Cleve- land	Birm- ingham	Buffalo	Youngs- town	Spar- rows Point	Granite City	Middle- town, Ohio		Detroit	Johns- town	Seattle, S. Frisco, Los Angeles	Fontana
INGOTS Carbon forg <sup>1-9</sup>	\$50.00														
Alloy	\$61.00						(per net ton)								
BILLETS, BLOOMS, SLABS Carbon, re-rolling <sup>1,2</sup>	\$52.00				\$52.00	\$52.00	(per net ton)						\$52.00		
Carbon forging billets	\$61.00	\$61.00	\$61.00	\$61.00	\$61.00	\$61.00	(per net ton)						\$61.00		
Alloy	\$63.00	\$63.00				\$63.00	(Bethlehem, Canton, Massillon = \$63.00) (per net ton)								
PIPE SKELP	3.25						3.25				Warren = 3.25				
WIRE RODS	3.40 to 4.15	3.40 to 3.90		3.40	3.40		3.65	3.50			Worcester 3.70		3.40	4.05 <sup>1,3</sup> 4.10 <sup>1,4</sup>	
SHEETS Hot-rolled <sup>6</sup>	3.25 to 3.30	3.25	3.25	3.25- 3.30	3.25	3.25	3.25	3.25		Warren, Ashland = 3.25		3.45		3.95 <sup>1,5</sup>	5.65
Cold-rolled <sup>1</sup>	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.20	4.00	Warren 4.00	4.20		Pittsburg, Cal. 4.95	
Galvanized (10 gage)	4.40	4.40	4.40		4.40			4.40	Canton = 4.40	4.40	Ashland = 4.40			5.15 <sup>1,5</sup>	
Enameling (12 gage)	4.40	4.40	4.40	4.40			4.40		4.60	4.40		4.70			
Long term <sup>2</sup> (10 gage)	4.80		4.80							4.80					
STRIP Hot-rolled <sup>3</sup>	3.25 to 3.30	3.25 to 3.30	3.25	3.25 to 3.30	3.25	3.25	3.25	3.25		3.25	Warren = 3.25	3.45		4.00 to 4.25	5.90
Cold-rolled <sup>4</sup>	4.00	4.25		4.00		4.00	4.00	4.00		New Haven 4.50 Warren = 4.00 to 4.25		4.20 to 4.50			7.10
TINPLATE Cokes, 1.50 lb. <sup>8</sup> base box	\$7.75	\$7.75	\$7.75		\$7.85			\$7.85	\$7.95	Warren, Ohio = \$7.75				Pittsburg, Cal. = \$8.50	
Electrolytic 0.25, 0.50, 0.75 lb. box	Deduct \$1.30, \$1.05 and 75¢ respectively from 1.50 lb. coke base box price														
TERNES MFG., special coated	Deduct \$1.10 from 1.50 lb. coke base box price														
BLACKPLATE CANMAKING 55 to 128 lb.	Deduct \$2.00 from 1.50 lb. coke base box price														
BLACKPLATE, h.e., 29 ga. <sup>10</sup>	5.30	5.30	5.30					5.40		Warren, Ohio = 5.30					
BARS Carbon Steel	3.35 to 3.55	3.35	3.35	3.35	3.35	3.35	3.35	3.35		3.35	Canton = 3.35	3.55	3.35	4.05 to 4.10	5.30
Reinforcing (billet) <sup>7</sup>	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35			Canton = 3.35		3.35	4.05 to 4.10	5.30
Cold-finished <sup>8</sup>	3.95 to 4.00	4.00	4.00	4.00		4.00	4.00					4.30			
Alloy, hot-rolled	3.75	3.75	3.75			3.75	3.75	Bethlehem, Canton, Massillon = 3.75				4.05	3.75	4.80 <sup>1,4</sup>	4.75
Alloy cold-drawn	4.65 to 4.75	4.65	4.65	4.65		4.65	4.65	Massillon = 4.65			Worcester 4.95				
PLATE Carbon steel <sup>11</sup>	3.40 to 3.60	3.40	3.40	3.40 to 3.60	3.40 Cons hohocken	3.45 = 3.95	3.40 = 3.95	3.45 Coatesville = 3.75, Claymont = 3.95 Geneva = 3.40, Harrisburg = 6.50				3.65	3.45	4.30 <sup>1,6</sup>	5.80
Floor plates	4.55	4.55		4.55				Cons hohocken = 4.55							
Alloy	4.40	4.40						Coatesville = 5.10							
SHAPES, Structural	3.25 to 3.30	3.25	3.25		3.25	3.30		Bethlehem = 3.30, Geneva, Utah = 3.25					3.30	3.85 to 4.30	5.75
MANUFACTURERS' WIRE <sup>9</sup> Bright	4.15	4.15		4.15	4.15		4.15	4.25	Duluth = 4.15, Worcester = 4.45				4.15	5.15 <sup>1,3</sup>	
Spring (high carbon)	5.20	5.20		5.20				5.30	Worcester = 5.50 New Haven, Trenton = 5.50				5.20	Duluth = 5.20-6.15	
PILING, Steel sheet	4.05	4.05				4.05									

# PRICES

## STAINLESS STEELS

Base prices, in cents per pound, f.o.b. producing point

Product	Chromium Nickel						Straight Chromium		
	301	302	303	304	316	347	410	416	430
Ingot, re-rolling	12.75	13.50	15.00	15.50	22.75	20.00	11.25	13.75	11.50
Slabs, billets, re-rolling	17.00	18.25	20.25	19.25	30.25	26.75	15.00	18.50	15.25
Forging discs, die blocks, rings	30.50	30.50	33.00	32.00	49.00	41.00	24.50	25.00	25.00
Billets, forging	24.25-26.50	24.25-26.50	26.25-28.75	25.50-27.75	39.00-42.75	32.75-35.75	19.50-21.50	20.00-21.75	20.00-21.75
Bars, wire, structurals	28.50	28.50	31.00	30.00	46.00	38.50	23.00	23.50	23.50
Plates	32.00	32.00	34.00	34.00	50.50	44.00	26.00	26.50	26.50
Sheets	37.50-40.75	37.50-40.75	39.50-43.00	39.50-43.00	53.00-57.25	50.00-54.00	33.00	33.50	35.50
Strip, hot-rolled	24.25	25.75	30.00	27.75	46.00	38.75	21.25	28.00	21.75
Strip, cold-rolled	30.50-30.75	33.00-33.50	36.50-39.50	35.00-35.75	55.00-57.25	48.50-50.00	27.00	33.50	27.50

## ELECTRODES

Cents per lb. f.o.b. plant, threaded electrodes with nipples, unboxed

Diameter in in.	Length in in.	
<b>Graphite</b>		
17, 18, 20	60, 72	16.00¢
8 to 16	48, 60, 72	16.50¢
7	48, 60	17.75¢
6	48, 60	19.00¢
4, 5	40	19.50¢
3	40	20.50¢
2½	24, 30	21.00¢
2	24, 30	23.00¢
<b>Carbon</b>		
40	100, 110	7.50¢
35	65, 110	7.50¢
30	65, 84, 110	7.50¢
24	72 to 104	7.50¢
17 to 20	84, 90	7.50¢
14	60, 72	8.00¢
10, 12	60	8.25¢
8	60	8.50¢

## TOOL STEEL

F.o.b. mill					Base per lb
W	Cr	V	Mo	Co	
18	4	1	—	—	90.5¢
18	4	1	—	5	\$1.42
18	4	2	—	—	\$1.025
1.5	4	1.5	8	—	65¢
6	4	2	6	—	69.5¢
High-carbon-chromium					52¢
Oil hardened manganese					29¢
Special carbon					26.5¢
Extra carbon					22¢
Regular carbon					19¢

Warehouse prices on and east of Mississippi are 2½¢ per lb higher. West of Mississippi 4½¢ higher.

## C-R SPRING STEEL

Base per pound f.o.b. mill	
0.26 to 0.40 carbon	4.00¢
0.41 to 0.60 carbon	5.50¢
0.61 to 0.80 carbon	6.10¢
0.81 to 1.05 carbon	8.05¢
1.06 to 1.35 carbon	10.35¢

Worcester, add 0.30¢.

## CLAD STEEL

Base prices, cents per pound		
	Plate	Sheet
<b>Stainless clad</b>		
No. 304, 20 pct. f.o.b. Coatesville, Pa.	\$26.50	
Washington, Pa.	\$26.50	\$22.50
Claymont, Del.	\$26.50	
Conshohocken, Pa.		\$22.50
<b>Nickel-clad</b>		
10 pct f.o.b. Coatesville, Pa.	27.50	
<b>Inconel-clad</b>		
10 pct. f.o.b. Coatesville.	36.00	
<b>Monel-clad</b>		
10 pct. f.o.b. Coatesville.	29.00	
<b>Aluminized steel sheets</b>		
Hot dip, 20 gage, f.o.b. Butler, Pa.		9.25

\* Includes annealing and pickling, or sandblasting.

## MERCHANT WIRE PRODUCTS

To the dealer, f.o.b. mill

Base Column		
Pittsburg, Calif.		
Standard & coated nails*	103	123
Galvanized nails*	103	123
Woven wire fence†	109	132
Fence posts, carloads††	114	...
Single loop bale ties	106	130
Galvanized barbed wire**	123	143
Twisted barless wire...	123	...

\* Pgh., Chi., Duluth; Worcester, 6 columns higher. † 15½ gage and heavier. \*\* On 80 rod spools, in carloads. †† Duluth only.

Base per		
100 lb	Pittsburg, Calif.	
Annealed fence wire†	\$4.80	\$5.75
Annealed, galv. fencing†	5.25	6.20
Cut nails, carloads††	6.75	...

† Add 30¢ at Worcester; 10¢ at Sparrows Pt.  
†† Less 20¢ to jobbers.

## ELECTRICAL SHEETS

24 gage, HR cut lengths, f.o.b. mill

	Cents per lb
Armature	5.45 to 6.00
Electrical	5.95 to 6.55
Motor	6.70 to 6.95
Dynamo	7.50 to 7.75
Transformer 72	8.05 to 10.05
Transformer 65	8.60 to 10.60
Transformer 58	9.30 to 11.30
Transformer 52	10.10 to 11.35

## RAILS, TRACK SUPPLIES

F.o.b. mill

Standard rails, 100 lb and heavier, No. 1 quality, per 100 lb.	\$3.20†
Joint bars, 100 lb	4.25
Light rails (from billets) per 100 lb	3.55

Base Price cents per lb

Track spikes	5.35
Axles	5.20
Screw spikes	8.00
Tie plates	4.05
Tie plates, Pittsburgh, Calif.*	4.20
Track bolts, untreated	8.25
Track bolts, heat treated, to railroads	8.50

\*Seattle, add 30¢.

†CF&I and Inland, \$3.50.

## HIGH STRENGTH, LOW ALLOY STEELS

Mill base prices, cents per pound

Steel	Aldecor	Corten	Double Strength No. 1	Dynalloy	Hi Steel	Mayari R	Otis-coley	Yoloy	NAX High Tensile
Producer	Republic	Carnegie-Illinois, Republic	Republic	Alan Wood	Inland	Bethlehem	Jones & Laughlin	Youngstown Sheet & Tube	Great Lakes Steel
Plates	5.20	5.20	5.20	5.30	5.20	5.30	5.20	5.40	5.85
<b>Sheets</b>									
Hot-rolled	4.95	4.95	4.95	5.25	4.95	4.95	4.95	5.15	5.25
Cold-rolled	6.05	6.05	6.05	...	6.05	6.05	6.05	6.25	6.35
Galvanized	...	6.75	...	...	...	6.75	...	...	...
<b>Strip</b>									
Hot-rolled	4.95	4.95	4.95	...	4.95	4.95	4.95	5.15	5.25
Cold-rolled	...	...	6.05	...	...	6.05	6.05	...	6.35
<b>Shapes</b>									
...	...	4.95	...	...	4.95	5.05	4.95	...	...
<b>Beams</b>									
...	...	4.95	...	...	...	...	...	...	...
<b>Bars</b>									
Hot-rolled	5.10	5.10	5.10	...	5.10	5.10	5.10	...	5.40
<b>Bar shapes</b>									
...	...	5.10	...	...	5.10	5.10	5.10	...	...



# PRICES

## PIPE AND TUBING

Base discounts, f.o.b. mills.  
Base price, \$200.00 per net ton.

### STANDARD, THREADED AND COUPLED

Steel, butt weld	Black	Galv.
1/2-in. ....	43 to 41	20 to 18
3/4-in. ....	46 to 44	24 to 22
1-in. ....	48 1/2 to 46 1/2	27 to 25
1 1/4-in. ....	49 to 47	27 1/2 to 25 1/2
1 1/2-in. ....	49 1/2 to 47 1/2	28 to 26
2-in. ....	50 to 48	28 1/2 to 26 1/2
2 1/2 to 3-in. ..	50 1/2 to 49 1/2	29 to 27

Steel, lap weld	Black	Galv.
2-in. ....	39 1/2	17 1/2
2 1/2 to 3-in. ..	39 1/2	21 1/2
3 1/2 to 6-in. ..	46 1/2 to 42	20 1/2 to 24 1/2

Steel, seamless	Black	Galv.
2-in. ....	38 1/2 to 27	16 1/2 to 5
2 1/2 to 3-in. ..	41 1/2 to 35	19 1/2 to 10 1/2
3 1/2 to 6-in. ..	43 1/2 to 38 1/2	21 1/2 to 16 1/2

Wrought Iron, butt weld	Black	Galv.
1/2-in. ....	+20 1/2	+52 1/2
3/4-in. ....	+10 1/2	+41 1/2
1 and 1 1/4-in. ..	+4 1/2	+32 1/2
2-in. ....	+1 1/2	+29
3-in. ....	+2	+28 1/2

Wrought Iron, lap weld	Black	Galv.
2-in. ....	+7 1/2	+36 1/2
2 1/2 to 3 1/4-in. ..	+5	+32
4-in. ....	list	+26
4 1/2 to 8-in. ..	+2	+27 1/2

### EXTRA STRONG, PLAIN ENDS

Steel, butt weld	Black	Galv.
1/2-in. ....	42 to 40	20 1/2 to 18 1/2
3/4-in. ....	46 to 44	24 1/2 to 22 1/2
1-in. ....	48 to 46	27 1/2 to 25 1/2
1 1/4-in. ....	48 1/2 to 46 1/2	28 to 26
1 1/2-in. ....	49 to 47	28 1/2 to 26 1/2
2-in. ....	49 1/2 to 47 1/2	29 to 27
2 1/2 to 3-in. ..	50 to 48	29 1/2 to 27 1/2

Steel, lap weld	Black	Galv.
2-in. ....	39 1/2	18 1/2
2 1/2 to 3-in. ..	44 1/2	23 1/2
3 1/2 to 6-in. ..	48 to 44	23 to 27

Steel, seamless	Black	Galv.
2-in. ....	37 1/2 to 32 1/2	16 1/2 to 11 1/2
2 1/2 to 3-in. ..	41 1/2 to 36 1/2	20 1/2 to 15 1/2
3 1/2 to 6-in. ..	45	24

Wrought Iron, butt weld	Black	Galv.
1/2-in. ....	+16	+46 1/2
3/4-in. ....	+9 1/2	+39 1/2
1 to 2-in. ....	+1 1/2	+28 1/2

Wrought Iron, lap weld	Black	Galv.
2-in. ....	+4 1/2	+33
2 1/2 to 4-in. ..	+5	+21 1/2
4 1/2 to 6-in. ..	+1	+26

For threads only, butt weld, lap weld and seamless pipe, one point higher discount (lower price) applies. For plain ends, butt weld, lap weld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lap weld and seamless 3 1/2-in. and larger four points higher discount (lower price) applies. On butt weld and lap weld steel pipe, jobbers are granted a discount of 5 pct. On L.C.I. shipments, prices are determined by adding 25 pct and 30 pct and the car-load freight rate to the base card.

## BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Prices per 100 ft at mill in carload lots, out length 4 to 24 ft inclusive.

OD	Gage	Seamless	Electric Weld
in.	BWG	H.R.	C.R.
2	13	19.18	22.56
2 1/2	12	25.79	30.33
3	12	28.68	33.76
3 1/2	11	35.85	42.20
4	10	44.51	52.35

## CAST IRON WATER PIPE

	Per net ton
6 to 24-in., del'd Chicago .....	\$106.70
6 to 24-in., del'd N. Y. ....	103.50 to 108.40
6 to 24-in., Birmingham .....	93.50
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipment; rail and water shipment less .....	120.30
Class "A" and gas pipe, \$5 extra; 4-in. pipe is \$5 a ton above 6-in.	

## BOLTS, NUTS, RIVETS, SET SCREWS

### Consumer Prices

(Bolts and nuts f.o.b. mill Pittsburgh, Cleveland, Birmingham or Chicago)

Base discount less case lots

### Machine and Carriage Bolts

	Pot Off List
1/2 in. & smaller x 6 in. & shorter .....	35
9/16 & 5/8 in. x 6 in. & shorter .....	37
3/4 in. & larger x 6 in. & shorter .....	34
All diam, longer than 6 in. ....	30
Lag, all diam over 6 in. longer .....	35
Lag, all diam x 6 in. & shorter .....	37
Flow bolts .....	47

### Nuts, Cold Punched or Hot Pressed (Hexagon or Square)

1/2 in. and smaller .....	35
9/16 to 1 in. inclusive .....	34
1 1/8 to 1 1/2 in. inclusive .....	32
1 1/2 in. and larger .....	27
On above bolts and nuts, excepting plow bolts, additional allowance of 15 pct for full container quantities. There is an additional 5 pct allowance for carload shipments.	

### Semifinished Hexagon Nuts

	USS	SAE
7/16 in. and smaller .....	41	
1/2 in. and smaller .....	38	
1/2 in. through 1 in. ....		39
9/16 in. through 1 in. ....	37	
1 1/8 in. through 1 1/2 in. ....	35	37
1 1/2 in. and larger .....	28	
In full case lots, 15 pct additional discount.		

### Stove Bolts

Packages, nuts separate .....	\$61.75
In bulk .....	70.00

### Large Rivets

	(1/2 in. and larger)
	Base per 100 lb
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham .....	\$6.75
F.o.b. Lebanon, Pa. ....	6.75

### Small Rivets

	(7/16 in. and smaller)
	Pot off List
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham .....	48

### Cap and Set Screws (In packages)

	Pot Off List
Hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in., SAE 1020, bright .....	46
1/2 to 1 in. x 6 in., SAE (1035), heat treated .....	35
Milled studs .....	19
Flat head cap screws, listed sizes ..	5
Fillister head cap, listed sizes .....	28

## FLUORSPAR

Washed gravel fluorspar, f.o.b. cars, Rosiclare, Ill.

	Base price per
	Effective CaF <sub>2</sub> Content: net ton
70% or more .....	\$37.00
60% or less .....	34.00

## LAKE SUPERIOR ORES

(51.50% Fe, Natural Content, Delivered Lower Lake Ports)

	Per Gross Ton
Old range, bessemer .....	\$7.60
Old range, nonbessemer .....	7.45
Mesabi, bessemer .....	7.35
Mesabi, nonbessemer .....	7.20
High phosphorus .....	7.20
After Dec. 31, 1948, increases or decreases in Upper Lake freight, dock and handling charges and taxes thereon to be for the buyers' account.	

## METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.i.f. New York, ocean bags .....	7.9¢ to 9.0¢
Domestic sponge iron, 98+ % Fe, carload lots .....	9.0¢ to 15.0¢
Electrolytic iron, annealed, 99.5+ % Fe .....	31.5¢ to 39.5¢
Electrolytic iron, unannealed, minus 325 mesh, 99+ % Fe .....	48.5¢
Hydrogen reduced iron, minus 300 mesh, 98+ % Fe .....	63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 microns, 98%, 99.3+ % Fe ..	90.0¢ to \$1.75
Aluminum .....	31.00¢
Antimony .....	51.17¢
Brass, 10 ton lots .....	27.25 to 37.25¢
Copper, electrolytic .....	33.625¢
Copper, reduced .....	34.25¢
Cadmium .....	\$2.40
Chromium, electrolytic, 99% min. ....	\$3.50
Lead .....	26.00¢
Manganese .....	60.00¢
Molybdenum, 99% .....	\$2.65
Nickel, unannealed .....	67.00¢
Nickel, spherical, minus 30 mesh, unannealed .....	68.00¢
Silicon .....	34.00¢
Solder powder .....	8.5¢ plus metal cost
Stainless steel, 302 .....	75.0¢
Tin .....	\$1.155
Tungsten, 99% .....	\$2.90
Zinc, 10 ton lots .....	17.75 to 22.25¢

## COKE

	Net Ton
Furnace, beehive (f.o.b. oven) Connellsville, Pa. ....	\$14.00 to \$15.00
Foundry, beehive (f.o.b. oven) Connellsville, Pa. ....	\$16.00 to \$17.00
Foundry, Byproduct	
Buffalo, del'd .....	\$22.95
Chicago, f.o.b. ....	20.40
Detroit, f.o.b. ....	19.40
New England, del'd .....	23.35
Seaboard, N. J., f.o.b. ....	21.50
Philadelphia, f.o.b. ....	21.05
Swedeland, Pa., f.o.b. ....	21.00
Painesville, Ohio, f.o.b. ....	20.90
Erie, del'd .....	\$21.50 to 23.50
Cleveland, del'd .....	22.45
Cincinnati, del'd .....	21.50
St. Paul, f.o.b. ....	23.50
St. Louis, del'd .....	20.95
Birmingham, del'd .....	18.66

## REFRACTORIES

(F.o.b. Works)

Fire Clay Brick	Carloads, Per 1000
First quality, Pa., Md., Ky., Mo., Ill. (except Salina, Pa., add \$5) ..	\$80.00
No. 1 Ohio .....	74.00
Sec. quality, Pa., Md., Ky., Mo., Ill. ....	74.00
No. 2 Ohio .....	66.00
Ground fire clay, net ton, bulk (except Salina, Pa., add \$1.50) .....	11.50
Silica Brick	
Mt. Union, Pa., Ensley, Ala. ....	\$80.00
Childs, Pa. ....	84.00
Hays, Pa. ....	85.00
Chicago District .....	89.00
Western, Utah and Calif. ....	95.00
Super Duty, Hays, Pa., Athens, Tex. ....	85.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.) ..	\$13.75 to 14.00
Silica cement, net ton, bulk, Hays, Pa. ....	16.00
Silica cement, net ton, bulk, Ensley, Ala. ....	15.00
Silica cement, net ton, bulk, Chicago District .....	14.75
Silica cement, net ton, bulk, Utah and Calif. ....	21.00
Chrome Brick	
Standard chemically bonded, Balt., Chester .....	\$69.00
Magnesite Brick	
Standard, Balt. and Chester .....	\$91.00
Chemically bonded, Balt. and Chester .....	80.00
Grain Magnesite	
Std. 1/2-in. grains	
Domestic, f.o.b. Balt. and Chester, in bulk, fines removed .....	\$56.50
Domestic, f.o.b. Chewelah, Wash., in bulk with fines .....	\$30.50 to 31.00
in sacks with fines .....	35.00 to 35.50
Dead Burned Dolomite	
F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk, Midwest, add 10¢; Missouri Valley, add 20¢ ..	\$12.25

# PRICES

## WAREHOUSE PRICES

Base prices, f.o.b. warehouse, dollars per 100 lb.  
(Metropolitan area delivery, add 15¢ to base price except Cincinnati and  
New Orleans (\*), add 10¢; New York, add 20¢.)

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled			Hot-Rolled	Cold-Finished	Hot-Rolled, A 4615 As-rolled	Hot-Rolled, A 4140-50 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140-50 Ann.
Baltimore.....	5.31	6.21-6.41	6.95-7.11	5.37	.....	5.56	5.36	5.42	6.18	.....	10.10	.....	.....
Birmingham.....	5.06	.....	6.45	5.06	6.68	5.25	5.00	5.00	6.68	.....	.....	.....	.....
Boston.....	5.55	6.45-6.75	7.71-7.85	5.65-5.95	6.75	5.80	5.42	5.52	6.27	9.64-9.82	10.04-10.07	11.23-11.27	11.47-11.52
Buffalo.....	4.85	5.00-5.75	7.26-7.70	5.29-5.65	6.35-7.27	5.35	5.10	5.05-5.15	5.80	9.70-9.73	9.95-9.98	11.15-11.18	11.40-11.43
Chicago.....	4.85	5.75	7.10	4.85	6.68	5.10	.90	4.90	5.70	9.35-9.50	9.60-9.75	10.80-10.90	11.05-11.15
Cincinnati.....	5.16-5.28*	6.13*-6.18	7.53	5.28*-5.55	.....	5.53*-5.63	5.40*-5.48	5.33*-5.55	6.09*-6.10	9.74	9.99	11.19	11.44
Cleveland.....	4.98-5.16	5.75-6.06	7.20-7.46	5.03-5.15	.....	5.37-5.54	5.16-5.47	5.17-5.34	5.90-5.97	9.49-9.66	9.74-9.91	10.95-11.07	11.19-11.32
Detroit.....	5.28-5.32	6.07-6.18	7.53-7.58	5.28-5.47	6.27-6.58	5.53-5.57	5.40	5.33-5.55	6.01-6.10	9.69-9.82	9.94-10.07	11.11-11.14	11.35-11.39
Follansbee.....	4.85	5.75	7.15	.....	6.00	.....	.....	.....	.....	.....	.....	.....	.....
Houston.....	6.50-6.70	.....	8.50	7.00	.....	6.70	6.55	6.65	7.60	10.30	10.25	11.45	11.70
Indianapolis.....	5.15	6.05	7.39	5.15	6.25	5.40	5.20	5.35	6.50	.....	.....	.....	.....
Los Angeles.....	6.45-6.60	7.90-8.05	8.75-8.90	6.65-6.80	9.35*	6.15-7.60	5.96-6.25	6.10-9.35	7.95*-11.60	10.90-11.60	10.85-11.55	12.40-12.95	12.65-13.20
Memphis.....	5.75	6.60	.....	5.95	6.80	5.95	5.75	5.75	6.50	.....	.....	.....	.....
Milwaukee.....	5.03	5.93	7.28	5.38	6.86	5.28	5.08	5.08	5.87-5.88	9.53	9.78	10.98	11.23
New Orleans.....	5.95*	6.75*	.....	6.15*	.....	6.15*	5.95*	5.95*	6.65*	.....	.....	.....	.....
New York.....	5.40-5.51	6.46	7.71-7.86	5.62-5.96	.....	5.70-6.00	5.33-5.61	5.57-5.80	6.41-6.61	9.73-9.93	9.98-10.18	11.18-11.38	11.43-11.63
Norfolk.....	5.80	.....	.....	6.05	.....	6.05	6.05	6.05	7.05	.....	.....	.....	.....
Omaha.....	5.92	.....	9.18	5.92	.....	6.17	5.97	5.97	6.77	.....	.....	.....	.....
Philadelphia.....	5.15-5.44	6.36-6.79	7.33-7.43	5.35-5.45	6.74	5.38	5.10	5.40-5.45	6.19	9.50	9.75-10.34	10.95	11.20
Pittsburgh.....	4.85-4.90	5.75-7.70	7.15-7.70	5.10	6.00	5.20-5.25	4.95-5.15	5.00-5.10	5.65	9.35	9.60	10.40	11.30
Portland.....	6.50*-6.60	8.00-8.20	8.80-9.20	6.85*-7.10	.....	6.30*-7.60*	6.35*-7.00	6.35*-7.25	8.25*-7.55	10.50*	10.10*	.....	.....
Salt Lake City.....	7.05-8.00	8.20	7.90-9.06	7.10-7.70	.....	5.75-8.85	6.65-7.00	6.95-7.25	7.40-7.55	.....	.....	.....	.....
San Francisco.....	5.95*-6.00	7.15-7.85	8.25-8.70	6.75*-7.65	.....	7.60*-8.20	5.90*-6.15	5.90*-6.20	7.55-8.05	10.90	10.85	10.40	12.65
Seattle.....	6.20*-7.10	7.75-8.65	7.65-9.15	6.55*-6.70	.....	6.20-6.35	6.15-6.30	6.05*-6.20	8.00*-8.15	.....	10.30*-11.35	.....	12.00*-14.10
St. Louis.....	5.21-5.37	6.12-6.27	7.47-7.52	5.22-5.97	8.68	5.47-5.62	5.27-5.42	5.27-5.92	6.07-6.22	9.72	9.97	.....	11.42
St. Paul.....	5.44	6.19-6.34	7.74	5.44	6.82	5.64-6.69	5.49	5.49	6.29	.....	.....	.....	.....

## BASE QUANTITIES

Standard unless otherwise keyed on prices.

## HOT-ROLLED:

Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

## COLD-ROLLED:

Sheets, 400 to 1999 lb; strip, extras on all quantities bars 1000 lb and over.

## ALLOY BARS:

1000 to 1999 lb.

## GALVANIZED SHEETS:

450 to 1499 lb.

## EXCEPTIONS:

(1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to 9999 lb; (5) 2000 lb and over; (6) 1000 lb and over; (7) 400 to 14,999 lb; (8) 400 lb and over; (9) 500 to 1999 lb; (10) 500 to 999 lb; (11) 400 to 9999 lb; (12) 450 to 3749 lb; (13) 400 to 1999 lb; (14) 1500 lb and over; (15) 1000 to 4999 lb; (16) 4000 lb and over; (17) up to 1999 lb; (18) 1000 to 1499 lb.

## PIG IRON PRICES

Dollars per gross ton. Delivered prices represent minimums. Delivered prices do not include 3 pct tax on freight nor the 6 pct increase on total freight charges in the Eastern Zone (5 pct Southern Zone, 4 pct Western Zone), effective Jan. 11, 1949.

### PRODUCING POINT PRICES

Producing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem.....	48.00	.....	.....	.....	.....
Birmingham.....	42.88	43.38	.....	.....	.....
Buffalo.....	47.00	47.00	47.50	.....	.....
Chicago.....	46.00	46.50	46.50	47.00	.....
Cleveland.....	46.00	46.50	46.50	47.00	51.00
Duluth.....	46.00	46.50	46.50	47.00	.....
Erie.....	46.00	46.50	46.50	47.00	.....
Everett.....	47.90	52.75	53.25	.....	.....
Granite City.....	46.00	46.40	46.90	.....	.....
Ironton, Utah.....	46.00-55.00	46.50-55.50	.....	.....	.....
Lone Star, Texas.....	50.00	50.50	.....	.....	.....
Neville Island.....	46.00	46.50	46.50	.....	.....
Geneva, Utah.....	46.00	46.50	.....	.....	.....
Sharpville.....	46.00	46.50	46.50	47.00	.....
Steelton.....	46.00	46.50	49.00	49.50	54.00
Struthers, Ohio.....	46.00	.....	.....	.....	.....
Swadeland.....	50.00	50.50	51.00	51.50	.....
Toledo.....	46.00	46.50	46.50	47.00	.....
Troy, N. Y.....	.....	.....	.....	.....	54.00
Youngstown.....	46.00	46.50	46.50	.....	.....

### DELIVERED PRICES (BASE GRADES)

Consuming Point	Producing Point	Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Boston.....	Everett.....	\$0.50 Arb.	.....	52.75	53.25	.....	.....
Boston.....	Steelton.....	6.27	54.27	54.77	55.27	58.77	60.27
Brooklyn.....	Bethlehem.....	3.90	51.90	.....	.....	.....	.....
Cincinnati.....	Birmingham.....	6.09	48.97	49.46	.....	.....	.....
Jersey City.....	Bethlehem.....	2.39	50.39	.....	.....	.....	.....
Los Angeles.....	Geneva-Ironton.....	6.93	52.93-61.93	53.43-49.03	.....	.....	.....
Manfield.....	Cleveland-Toledo.....	3.03	48.03	49.53	49.53	50.03	54.03
Philadelphia.....	Bethlehem.....	2.21	50.21	.....	.....	.....	.....
Philadelphia.....	Swadeland.....	1.31	51.31	51.81	52.31	52.81	.....
Philadelphia.....	Steelton.....	2.81	50.81	51.31	51.81	52.31	56.81
San Francisco.....	Geneva-Ironton.....	6.93	52.93-61.93	53.43-62.43	.....	.....	.....
Seattle.....	Geneva-Ironton.....	6.93	52.93-61.93	53.43-62.43	.....	.....	.....
St. Louis.....	Granite City.....	0.75 Arb.	48.65	49.15	49.65	.....	.....

† Low Phos, Southern Grade

Producing point prices are subject to switching charges; silicon differential (not to exceed 50¢ per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct for foundry iron); phosphorus differentials, a reduction of 35¢ per ton for phosphorus content of 0.70 pct and over manganese differentials, a charge not to exceed 50¢ per ton for each 0.50 pct manganese content in excess

of 1.00 pct. \$2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and \$1 per ton extra for each additional 0.25 pct nickel.

Silvery iron (blast furnace) silicon 6.00 to 6.50 pct. C/L per g.t., f.o.b. Jackson, Ohio—\$59.50; f.o.b. Buffalo, \$60.75. Add \$125 per ton for each additional 0.50 pct Si up to 12 pct. Add 50¢ per ton for each 0.50 pct

Mn over 1.00 pct. Add \$1.00 per ton for 0.75 pct or more P. Bessemer ferro-silicon prices are \$1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorus \$66.00 per gross ton, f.o.b. Lyles, Tenn. Delivered Chicago, \$73.78. High phosphorus charcoal pig iron is not being produced.



# FERROALLOY PRICES

## Ferromanganese

78-82% Mn, Maximum contract base price, gross ton, lump size.	
F.o.b. Birmingham	\$174
F.o.b. Niagara Falls, Alloy, W. Va., Welland, Ont.	\$160
F.o.b. Johnstown, Pa.	\$174
F.o.b. Sheridan, Pa.	\$172
F.o.b. Etna, Pa.	\$163
\$2.00 for each 1% above 82% Mn; penalty, \$2.00 for each 1% below 78%.	
Briquets—Cents per pound of briquet, delivered, 66% contained Mn.	10.0
Carload, bulk	11.6
Ton lots	12.5
Less ton lots	12.5

## Spiegeleisen

Contract prices gross ton, lump, f.o.b.	
16-19% Mn 19-21% Mn	
3% max. Si 3% max. Si	
Palmerton, Pa.	\$61.00
Pgh. or Chicago	\$65.00
	\$66.00

## Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.	
96% min. Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.	
Carload, packed	35.5
Ton lots	37.0

## Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.	
Carloads	28
Ton lots	30
Less ton lots	32

## Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, delivered.	
Carloads Ton Less	
0.07% max. C, 0.06% P, 90% Mn	25.25 27.10 28.30
0.10% max. C	24.75 26.60 27.80
0.15% max. C	24.25 26.10 27.30
0.30% max. C	23.75 25.60 26.80
0.50% max. C	23.25 25.10 26.30
0.75% max. C	
1.00% max. C	20.25 22.10 23.30

## Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C.	
Carload bulk	8.60
Ton lots	10.25
Briquet, contract basis, carlots, bulk delivered, per lb of briquet	10.0
Ton lots	11.6
Less ton lots	12.5

## Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, openhearth \$84.00, foundry, \$85.00; \$84.75 f.o.b. Niagara Falls; Electric furnace silvery iron is not being produced at Jackson. Add \$1.00 per ton for each additional 0.50% Si up to and including 18%. Add \$1.00 for each 0.50 pct. Mn over 1 pct.	
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## Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.	
96% Si, 2% Fe	20.70
97% Si, 1% Fe	21.10

## Silicon Briquets

Contract price, cents per pound of briquet, bulk, delivered, 40% Si, 1 lb Si briquets.	
Carload, bulk	6.30
Ton lots	7.90
Less ton lots	8.80

## Electric Ferrosilicon

Contract price, cents per pound contained Si, lump size, bulk, in carloads, delivered.	
25% Si	13.50
50% Si	11.30
75% Si	13.50
85% Si	14.65
90-95% Si	16.50

## Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.	
Cast Turnings Distilled	
Ton lots	\$2.05 \$2.95 \$3.75
Less ton lots	2.40 3.30 4.55

## Ferrochrome

Contract prices, cents per pound, contained Cr, lump size, bulk, in carloads, delivered. (65-72% Cr, 2% max. Si)	
0.06% C	28.75
0.10% C	28.25
0.15% C	28.00
0.20% C	27.75
0.50% C	27.50
1.00% C	27.25
2.00% C	27.00
65-69% Cr, 4-9% C	20.50
62-66% Cr, 4-6% C, 6-9% Si	21.35
Briquets—Contract price, cents per pound of briquet, delivered, 60% chromium.	
Carload, bulk	13.75
Ton lots	15.25
Less ton lots	16.15

## High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% N.	
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## S. M. Ferrochrome

Contract price, cents per pound chromium contained, lump size, delivered.	
High carbon type: 60.65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.	
Carloads	21.60
Ton lots	23.75
Less ton lots	25.25
Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.	
Carloads	27.75
Ton lots	30.05
Less ton lots	31.85

## Chromium Metal

Contract prices, cents per lb chromium contained packed, delivered, ton lots. 97% min. Cr, 1% max. Fe.	
0.20% max. C	1.09
0.50% max. C	1.05
3.00% min. C	1.04

## Calcium—Silicon

Contract price per lb of alloy, lump, delivered.	
30-33% Ca, 60.65% Si, 3.00% max. Fe.	
Carloads	17.90
Ton lots	21.00
Less ton lots	22.50

## Calcium—Manganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered.	
16-20% Ca, 14-18% Mn, 53-59% Si.	
Carloads	19.25
Ton lots	21.55
Less ton lots	22.55

## CMSZ

Contract price, cents per pound of alloy, delivered.	
Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.	
Alloy 5: 50-56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.	
Ton lots	19.75
Less ton lots	21.00

## V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.	
Ton lots	15.75¢
Less ton lots	17.00¢

## Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.	
Ton lots and carload packed	18.00¢
Less ton lots	19.50¢

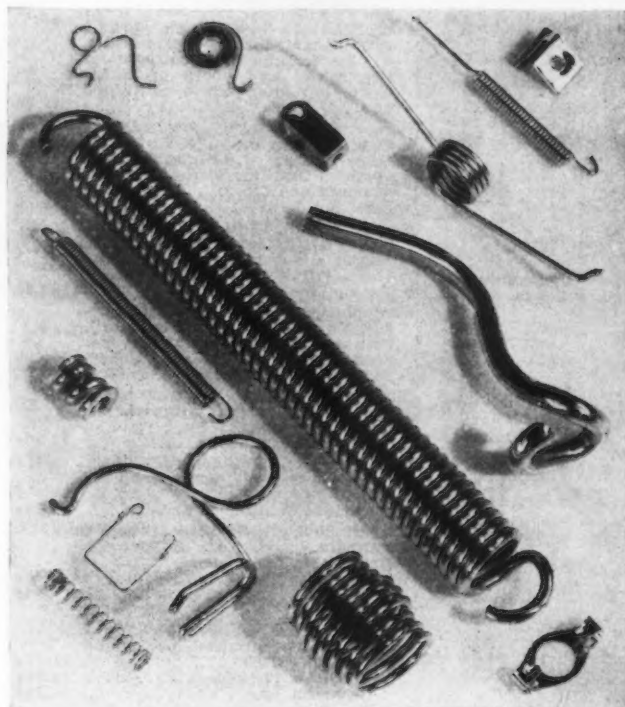
## SMZ

Contract price, cents per pound of alloy, delivered. 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.	
Ton lots	17.25
Less ton lots	18.50

## Other Ferroalloys

Ferrotungsten, standard, lump or ¾ x down, packed, per pound contained W, 5 ton lots, delivered.	\$2.25
Ferrovanadium, 35-55%, contract basis, delivered, per pound, contained, V.	
Openhearth	\$2.90
Crucible	3.00
High speed steel (Primos)	3.10
Vanadium pentoxide, 88-92% V <sub>2</sub> O <sub>5</sub> , contract basis, per pound contained V <sub>2</sub> O <sub>5</sub> .	\$1.20
Ferrocolumbium, 50-60% contract basis, delivered, per pound contained Cb.	
Ton lots	\$2.90
Less ton lots	2.95
Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo.	\$1.10
Calcium molybdate, 45-50%, f.o.b. Langeloth, Pa., per pound contained Mo.	96¢
Molybdenum oxide briquets, f.o.b. Langeloth, Pa., per pound contained Mo.	95¢
Ferrotitanium, 40%, regular grade, 10% C max., f.o.b. Niagara Falls, N. Y., freight allowed east of Mississippi and north of Baltimore, ton lots, per lb contained Ti.	\$1.28
Ferrotitanium, 25%, low carbon, f.o.b. Niagara Falls, N. Y., freight allowed east of Mississippi and north of Baltimore, ton lots, per lb contained Ti.	\$1.40
Less ton lots	1.45
Ferrotitanium, 15 to 19%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed east of Mississippi and north of Baltimore, carloads, per net ton	\$160.00
Ferrophosphorus, electrolytic, 23-26%, carlots, f.o.b. Siglo, Mt. Pleasant, Tenn., \$3 unitage, per gross ton	\$65.00
10 tons to less carload	75.00
Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Ton lots	21.00¢
Zirconium, 12-15%, contract basis, lump, delivered, per pound of alloy.	
Carload, bulk	6.60¢
Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.	
Carload	8.90¢
Ton lots	9.80¢
Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound	
Carload, bulk	11.00¢
Ton lots, packed	11.25¢
Less ton lots	11.75¢
Boron Agents	
Contract prices per pound of alloy, delivered.	
Ferroboration, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D.	
Ton lot	\$1.20
Manganese—Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, delivered.	
Ton lots	\$1.67
Less ton lots	1.79
Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered.	
Less ton lots	\$1.80
Silicaz, contract basis, delivered.	
Ton lots	45.00¢
Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.	
No. 1	93¢
No. 6	63¢
No. 79	45¢
Bortam, f.o.b. Niagara Falls	
Ton lots, per pound	45¢
Less ton lots, per pound	50¢
Carbortam, f.o.b. Suspension Bridge, N. Y.; freight allowed, Ti 15-18%, B 1.00-1.50%, Si 2.5-3.0%, Al 1.0-2.0%.	
Ton lots, per pound	8.625¢
Borosil, f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B.	\$6.25

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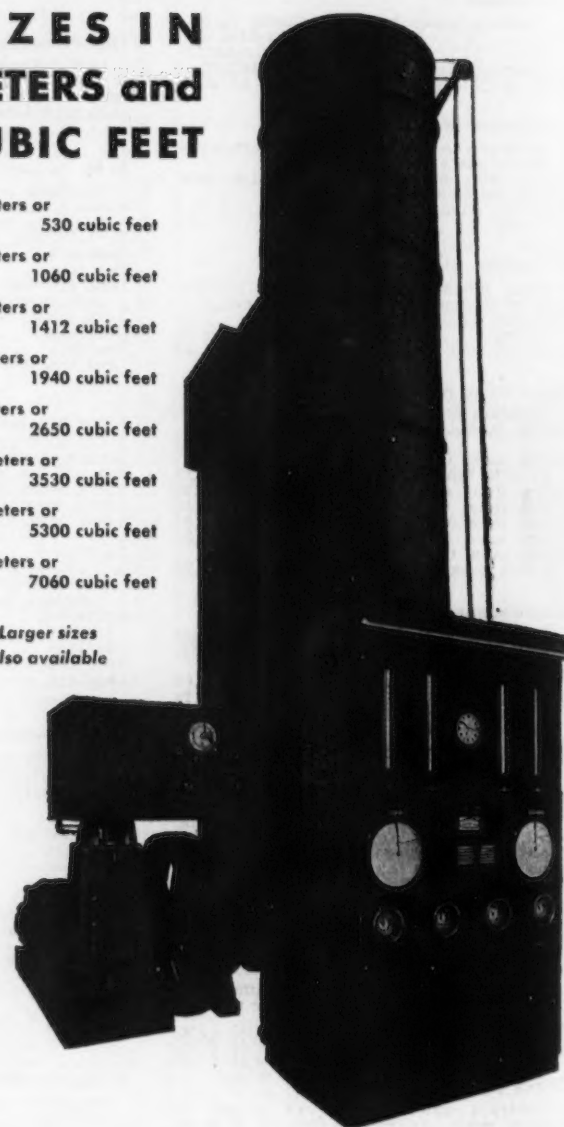
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40 Meters or	1412 cubic feet
55 Meters or	1940 cubic feet
75 Meters or	2650 cubic feet
100 Meters or	3530 cubic feet
150 Meters or	5300 cubic feet
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